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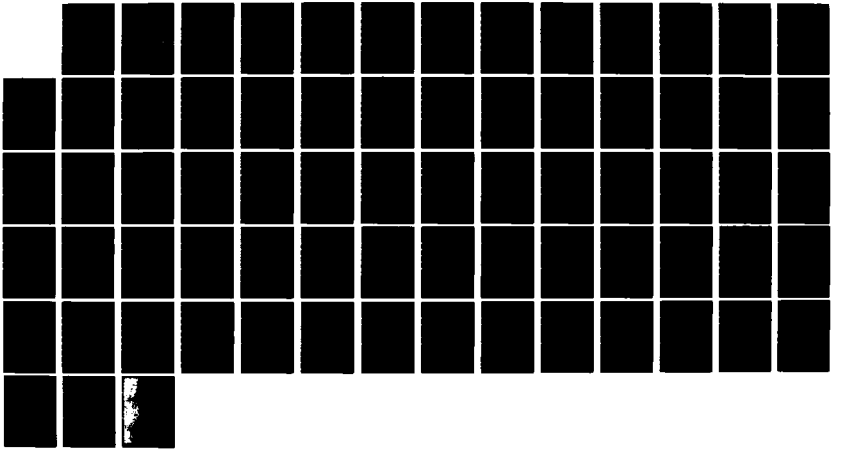

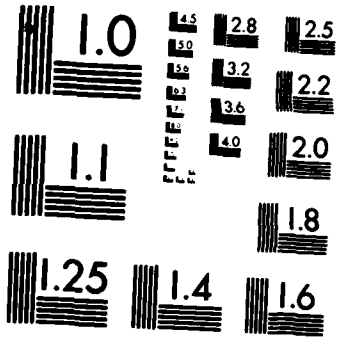

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Refresher Training Performance
Unauthorized Absence & Desertion Rates
Project Upgrade Discharges (Causes & Consequences)

**20. ABSTRACT** *(Continue on reverse side if necessary and identify by block number)*

This is a report of first findings from a two-purpose study of current value human resources accounting in Navy settings, and of causes and consequences of Project Upgrade, a program for discharging underperformers. Multiple waves of NHRMS data are correlated across time with multiple measures of unit performance and with Upgrade percentage. NHRMS indexes are found to predict unit performance in a "two-hump" pattern previously found for both Navy and civilian organizations Upgrade percentage is similarly predictable, across a surprisingly long time period. A typology of unit change, in unit functioning as measured by the NHRMS, also results, and seems associated with surprisingly differential effects.

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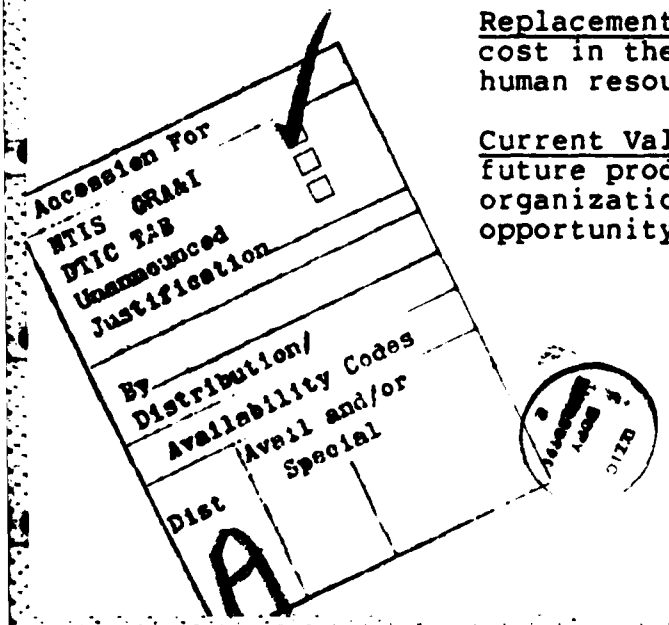
## Overview of the Research Plan

This report presents first results of analyses from data collected as part of a two-purpose research effort. The first purpose of the research was to generate and test a current value human resources accounting system for Navy units. The second purpose was to examine the causes and consequences of Project Upgrade, a two-phase program in which E1-E3 under-performers were discharged.

### Current Value Human Resources Accounting

The possibility and potential usefulness of a method of accounting for the value of human resources has been discussed in the professional literature for many years. First mentioned by Likert more than 25 years ago, the idea has gained greater credence in the last decade. (Likert 1955). Conceptualized by Hermanson (1964) and by Brummet, et al (1968), human resources accounting was thought to encompass three alternative and perhaps complementary methods:

> Incurred Cost Method - a procedure by which the amount already invested in human resources and as yet unrecovered is calculated.
>
> Replacement Cost Method - a procedure in which the cost in the current market of replacing existing human resources is calculated.
>
> Current Value Method - a procedure by which the future productive potential of existing human organization resources is calculated, discounted for opportunity costs, and capitalized.



Caplan and Landekich (1974), in their summary of the human resources accounting field, expressed the opinion that, of the three methods, the current value approach would be, in principle, the most valuable. At the same time, they felt it was the least likely ever to be realized, principally because of the vast amounts of data presumably required to generate the equations necessary to make it possible.

In an earlier effort sponsored by the Navy Manpower Research and Development Program, the present authors and their colleagues demonstrated that a current value method was, indeed, feasible and that the data requirements were not as prohibitive as they had been envisioned to be, (Pecorella, et al, 1978). In that research effort, extant data from ISR's Survey of Organizations data archive were combined with cost performance and absenteeism data from the operating records of a set of business firms. Equations were generated, performance gains and losses anticipated from changes in the human organization were calculated, dollar values were attributed, and the result discounted and capitalized.

The present effort builds upon that earlier one. It attempts to replicate the findings from civilian industry in Navy units themselves, relying upon a large data file which the project has assembled and which contains:

- Multiple waves of data from Navy units on the Human Resource Management Survey, a Navy-specific adaptation of the Survey of Organizations.

- Performance measures for those same Navy units over time, on the following dimensions:

  Readiness (FORSTAT) ratings
  Reenlistment rates
  Non-judicial punishment rates
  Unauthorized absence and desertion rates
  Refresher training performance

- Measures on the form of intervention and workshops conducted in these units by the Navy Human Resource Management Program.

The purpose of this portion of the research effort, therefore, is to develop and test a procedure by which anticipated gains or deteriorations in Navy unit performance can be forecast and their present or current value determined.

Project Upgrade

The second portion of the effort focuses upon the causes and consequences of Project Upgrade. Two alternative explanations may have credence. The first is that persons released for poor performance under Project Upgrade are individuals unsuited to Navy life who for some reason escaped a screening which would have eliminated them in advance. Since they form, at the very least, a distraction to effective unit functioning and, at worst, an active reducer of that functioning, subsequent data should reflect improvement.

An alternative possibility is an organizational or systemic explanation. According to this view, the incidence of Upgrade cases is a problem created by unit practices and conditions. It might be, for example, that these persons, for whatever reason, experience practices and treatment

which is demotivating. Relatively unmotivated, their performance deteriorates, resulting in their becoming candidates for discharge under Project Upgrade. If this were true, Navy units might well be creating a more or less constant pool of future Upgrade cases. In contrast to the individual level explanation, in which the correlates of functioning should occur after Upgrade discharges, this organizational explanation would predict strong relationships of Upgrade percentage to prior unit practices and performance.

The unit data set established for the human resources accounting portion of the research effort seemed suitable for testing possible organizational concomitants of Project Upgrade as well. Accordingly, this portion of the project seeks to examine the relationship of Upgrade incidence to those unit characteristics, in an effort to determine its causes and its consequences, together with policy-relevant information about its prevention.

## Sample, Measures, and Methods

Because of the sequence of events associated with the two portions of the effort, the sample of Navy units was drawn to meet the requirements of the human resources accounting analysis. At least two waves of NHRMS (survey) data were required. In addition, systematic record-keeping about HRM intervention activities began only in July 1978. Since these activities were seen as a source of the sort of

"leverage" required to generate measurable and accountable gains, it was seen as necessary to have information about them.

Accordingly, the sample was drawn to include all units which had had at least two waves of NHRMS data from July 1, 1978 to the time of selection (August 1981). Survey data for 67,100 respondents from these units on those measurement waves were provided to the project by the Navy Personnel Research and Development Center, which archives them. Provided as well were HRM intervention and activities data, reenlistment data, and refresher training (REFTRA) data. Other Navy offices and sources provided measures on readiness, non-judicial punishment, and unauthorized absences/desertion. Upgrade frequencies for these units were provided with the help of the sponsors of that portion of the project.

This procedure resulted in a sample of 174 units. Tables 1A-1B present their distribution by type and fleet. Because the HRM Program has worked much more with fleet than with shore units, the sample comes largely from the fleet.

An immediate question, therefore, was the extent to which this sample is representative of the fleet. To assess this, the percentage of the fleet represented by each ship type was calculated, and this percentage then multiplied to obtain a <u>desired N</u> for the sample for each such type. These desired N's were then correlated with the actual N occurring

in the sample. The high coefficients (.92, .91) suggest that the sample is, indeed, representative of types of both ships and aviation units.

TABLE 1A

PROJECT UPGRADE

"REPRESENTATIVENESS" CALCULATION FOR SHIPS

| SNDL 3 | GROUP | TYPE/ CLASS | NAVY N | % OF FLEET | DESIRED N | SAMPLE N | VARIANCE |
|---|---|---|---|---|---|---|---|
| 29 | Warships | | | | | | |
| 29A | | CG/CGN | 28 | 4.8 | 4 | 1 | -3 |
| 29B | | CV/CVN | 14 | 2.4 | 2 | 3 | +1 |
| 29C,D,E | | DD | 52 | 8.9 | 8 | 5 | -3 |
| 29F,BB | | DDG | 41 | 7.0 | 6 | 6 | 0 |
| 29G,AA | | FFG | 26 | 4.4 | 4 | 2 | -2 |
| 29H,J,K,L | | FF | 59 | 10.1 | 9 | 11 | +2 |
| 29M,P,S | | SS | 8 | 1.4 | 1 | 1 | 0 |
| 29N | | SSN | 94 | 16.1 | 14 | 12 | -1 |
| 29Q | | SSBN* | 62 | 10.6 | 9 | 11 | +1 |
| 29R | | BB | 1 | 0.2 | 0 | 0 | 0 |
| 29DD | | PHM | 4 | 0.7 | 1 | 0 | -1 |
| 30 | Mine Warfare Ships | | | | | | |
| 30A | | MSO | 25 | 4.3 | 4 | 6 | +2 |
| 31 | Amphibious Warfare Ships | | | | | | |
| 31A | | LCC | 2 | 0.3 | 0 | 0 | 0 |
| 31B | | LKA | 5 | 0.9 | 1 | 1 | 0 |
| 31G,32KK | | LPD | 13 | 2.2 | 2 | 4 | +2 |
| 31H | | LHA/LPH | 12 | 2.1 | 2 | 1 | -1 |
| 31J | | LSD | 13 | 2.2 | 2 | 3 | +1 |
| 31M | | LST | 20 | 3.4 | 3 | 6 | +3 |
| 32 | Auxiliary Ships | | | | | | |
| 32A | | AD | 10 | 1.7 | 1 | 1 | 0 |
| 32C | | AE | 12 | 2.1 | 2 | 2 | 0 |
| 32G | | AFS | 7 | 1.2 | 1 | 0 | -1 |
| 32H | | AOE | 4 | 0.7 | 1 | 0 | -1 |
| 32N | | AO | 6 | 1.0 | 1 | 0 | -1 |
| 32Q | | AOR | 7 | 1.2 | 1 | 1 | 0 |
| 32S | | AR | 4 | 1.0 | 1 | 1 | 0 |
| 32U | | AGDS | 1 | 0.2 | 0 | 0 | 0 |
| 32X | | ARS | 7 | 1.2 | 1 | 1 | 0 |
| 32DD | | AS | 13 | 2.2 | 2 | 3 | +1 |
| 32EE | | ASR | 6 | 1.0 | 1 | 4 | +3 |
| 32GG | | ATF | 5 | 0.9 | 1 | 1 | 0 |
| 32KK | | AGF 3,LPD 11 | 2 | 0.3 | 0 | 0 | 0 |
| 32MM | | AVM | 1 | 0.2 | 0 | 0 | 0 |
| 32QQ | | ATS | 3 | 0.5 | 0 | 0 | 0 |
| 32TT | | AVT | 1 | 0.2 | 0 | 0 | 0 |

| SNDL 3 | GROUP | TYPE/ CLASS | NAVY N | % OF FLEET | DESIRED N | SAMPLE N | VARIANCE |
|---|---|---|---|---|---|---|---|
| 33 | Patrol Craft | | | | | | |
| 33B | | PCH | 1 | 0.2 | 0 | 0 | 0 |
| 36 | Service Craft | | | | | | |
| | | AFDB/AFDL AFDM/ARD | | | | | |
| 36A | | ARDM | 9 | 1.5 | 1 | 1 | 0 |
| 36B | | MONOB | 1 | 0.2 | 0 | 0 | 0 |
| 36D | | DSV/DSRV | 5 | 0.9 | 1 | 0 | -1 |
| 36D | | DSV/DSRV | 5 | 0.9 | 1 | 0 | -1 |
| 36E | | IX | 1 | 0.2 | 0 | 0 | 0 |
| Totals | | | 585 | 0.149 | 87 | 87 | 0 |

*SSBN's are two crew ships, therefore, although there are only 31 ships, 62 units are counted.

TABLE 1B

PROJECT UPGRADE

"REPRESENTATIVENESS" CALCULATION FOR AVIATION UNITS

| SNDL # | GROUP | NAVY N | % OF FLEET | DESIRED N | SAMPLE N | VARIANCE |
|---|---|---|---|---|---|---|
| 42K | VA | 44 | 20.7 | 9 | 15 | +6 |
| 42L | VF | 29 | 13.6 | 4 | 5 | +1 |
| 42N | VS | 12 | 5.6 | 1 | 2 | +1 |
| 42P | VP | 37 | 17.4 | 6 | 8 | +2 |
| 42Q | VR/VRC/VRF | 6 | 2.8 | 0 | 2 | +2 |
| 42R | VC | 8 | 3.8 | 0 | 2 | +2 |
| 42S | VX/VXE/VXN | 6 | 2.8 | 0 | 1 | +1 |
| 42T | VTC | 5 | 2.3 | 0 | 0 | 0 |
| 42U | HC | 7 | 3.3 | 0 | 2 | +2 |
| 42W | HM | 3 | 1.4 | 0 | 1 | +1 |
| 42X | VQ | 5 | 2.3 | 0 | 0 | 0 |
| 42Y | VFP | 1 | 0.5 | 0 | 0 | 0 |
| 42Z | VAQ | 11 | 5.2 | 1 | 5 | +4 |
| 42BB | HS | 13 | 6.1 | 1 | 6 | +5 |
| 42CC | HSL | 9 | 4.2 | 0 | 3 | +3 |
| 42DD | VAW | 14 | 66 | 1 | 3 | +2 |
| 42GG | VFA | 1 | 0.5 | 0 | 0 | 0 |
| 42HH | HAL | 2 | 0.9 | 0 | 0 | 0 |
| Totals | | 213 | 0.469 | 23 | 55 | |

Pearson Correlation Navy N to Sample N: 0.917 $p < .01$.

Pearson Correlation (Surface and Subsurface Units) Navy N to Sample N: 0.91 $p < .01$.

Pearson Correlation (Surface, Subsurface, and Aviation Communities) Navy N to Sample N:0.6 $p < .01$.

## Survey Measures

The Navy Human Resource Management Survey (NHRMS) is an 88-item, paper and pencil questionnaire, administered to all or nearly all persons in a unit as a first step in its human resources development cycle. Originally derived from the 1969 edition of the Survey of Organizations, it has undergone several revisions. As constituted in the sample's time period, it contained items and indexes as listed in Table 2.

TABLE 2

LIST OF HRMS INDEXES

| . | . | Mean of Question(s) |
|---|---|---|
| 127 | Communication Flow | 1,2,3 |
| 128 | Decision-Making Practices | 4,5,6 |
| 129 | Motivational Conditions | 7,8,9 |
| 130 | Human Resource Emphasis | 10,11,12,13,14 |
| 131 | Fair and Equitable Treatment | 15,16,17,18 |
| 133 | Supervisory Support | 22,23,24,25 |
| 134 | Supervisory Team Coordination | 26,27 |
| 135 | Supervisory Team Emphasis | 28,29 |
| 136 | Supervisory Goal Emphasis | 30,31 |
| 137 | Supervisory Work Facilitation | 32,33,34 |
| 138 | Peer Support | 35,36,37 |
| 139 | Peer Team Coordination | 38,39 |
| 140 | Peer Team Emphasis | 40,41 |
| 141 | Peer Goal Emphasis | 42,43 |
| 142 | Peer Work Facilitation | 44,45,46 |
| 143 | Peer Coordination | 47,48,49,50 |
| 144 | Work Group Readiness | 51,52,53 |
| 145 | Discipline | 54,55 |
| 146 | Satisfaction | 56,57,58,59 60,62,62,63 |
| 147 | Lower Level Influence | 64,65 |
| 148 | Training | 66,67,68 |
| 149 | Equal Employment Opportunity | 69,70,71 72,73,74 |
| 150 | Drug and Alcohol Abuse* | |

*pre form-21 HRMS

A number of studies examining the internal consistency and reliability of these indexes and their relationship to unit performance indicators have been conducted. Summarized elsewhere, they indicate that the survey is a reliable, valid measure of Navy unit organizational functioning. (Bowers, 1981) Table 3 presents relevant alpha coefficients for 23 key NHRMS indexes.

TABLE 3

List of Alpha Coefficients for HRMS Indexes

| Index | Alpha |
|---|---|
| Communication Flow | .6959 |
| Decision-making Practices | .8141 |
| Motivation | .8044 |
| Human Resource Emphasis | .8407 |
| Supervisory Support | .9268 |
| Supervisory Team Coordination | .8519 |
| Supervisory Team Emphasis | .9083 |
| Supervisory Goal Emphasis | .7477 |
| Supervisory Work Facilitation | .9073 |
| Work Group Support | .8519 |
| Work Group Team Coordination | .8358 |
| Work Group Team Emphasis | .8895 |
| Work Group Goal Emphasis | .8031 |
| Work Group Facilitation | .8633 |
| Work Group Coordination | .8774 |
| Work Group Readiness | .7925 |
| Work Group Discipline | .8726 |
| Satisfaction | .8655 |
| Lower Level Influence | .7842 |
| Training | .7662 |
| Drug & Alcohol | .8432 |
| Goal Integration | .7539 |
| Military/Civilian Interface | .4150 |

Intervention Measures

For all units in the sample for which they were available, information was obtained from the Cycle Assessment Intervention forms. These contain information coded from three questionnaires completed by either the unit's Commanding Officer or the HRM Program's lead consultant who worked with the unit. Their content dealt with a description and evaluation of activities presented in conjunction with the human resources development cycle. Table 4 lists the information coded from these documents.

TABLE 4

A. The HRM Team Leader/Consultant Summary provided information about:

1. The extent of management involvement and support of the unit's HRM activities.

2. The extent to which command issues were addressed by the unit's HRM activities.

3. The consultant's judgement of the impact the HRM cycle would have on the unit in the future.

B. The Commanding Officer's one-month cycle Assessment Report provided information about:

1. Unit demographics

. The Command goals addressed by the HRAV.

3. The specific HRAV activities that were considered useful.

4. The CO's assessment of the HRM support team that worked with his unit.

5. The CO's expectations about the impact the HRM cycle might have on the unit.

C. The Commanding Officer's nine-month Cycle Assessment Questionnaire provided information about:

1. The CO's ratings of the HRM activity's usefulness to his command after nine months.

2. The specific HRAV activities that had helped most in achieving command goals.

Unit Performance Measures

As indicated earlier, five performance measures and Project Upgrade percentages were obtained for as many of the units as possible.

The problem of criterion stability was dealt with according to principles identified in an earlier report (Drexler and Franklin, 1976). Accordingly, reenlistment data were calculated in terms of calendar year quarters by unit for the period beginning July 1978, and ending December 1980. Unauthorized absence and desertion data, to obtain the desirable degree of stability, were calculated in six month or semi-annual periods, from October 1978 through October 1981. Readiness (FORSTAT) was calculated again in terms of calendar year quarters for the period 1 July 1978 through 30 June 1982. Non-judicial punishment rates were calculated also as quarterly data for the period July 1978 through September 1982. Refresher training data, available for only a small fraction of the units in the sample, was computed for evaluations occurring within a year prior to or following an HRM survey included in the sample.

Standardization and Relativization

The issues of standardization and relativization have been treated in depth elsewhere and will merely be mentioned here (Drexler and Franklin, 1976). In brief, it is essential that performance data for organizational, longitudinal analyses be standardized to control for the effects of seasonal and yearly variation. For example,

Since a higher proportion of persons enlist soon after high school graduation, reenlistment rates may be higher in the summer simply because of eligibility. Similarly, reenlistment might very well be higher for years when the nation's unemployment rate is high than in those when competitive jobs in the private sector are numerous. Furthermore, some measures--like that of the number of drug and marijuana discharges--have been counted differently over the years for which we have data. To correct for these kinds of seasonal and yearly variations, all of the performance measures were converted to standard scores by standardizing across all units within calendar periods.

Relativization involves arranging performance periods to take account of time lags in relation to a significant or first event. In the present instance, the period at which the Wave 1 NHRMS survey data were collected was taken as T (time) 0. Regardless of actual calendar date, the period immediately prior to T0 is counted as T-1. The period immediately following T0 is counted as T+1, and so forth. In this way, all units, regardless of the time of their first NHRMS survey, are placed in a common lag time framework. Because the performance data had been standardized before relativization, yearly variations in the measures that are not unit-specific have been controlled.

## Interrelationships Among NHRMS Indexes

Table 5 presents a matrix of intercorrelations of NHRMS indexes within Wave 1 (the first wave of survey data). Table 6 presents similar interrelationships within Wave 2 (the second or post-wave of survey data). Table 7 presents the correlation of each NHRMS index at Wave 1 with its counterpart measure at Wave 2. Several conclusions seem apparent from the data contained in these tables. First, indexes within either wave are highly correlated with one another. Second, indexes at Wave 1 are highly correlated with those same indexes at Wave 2. Third, there is no very large difference between the pattern of intercorrelation at Wave 1 and that at Wave 2. While multi-colinearity presents an obvious problem, two observations seem worth noting. First, there is ,indeed, some evidence to suggest that correlations within a domain, for example within the Command Climate domain, within the Supervisory Leadership domain, or within the Work group domain, are higher than are correlations between domains. This provides at least some evidence that the measures distinguish in ways in which we would expect. The second observation is that one would expect extremely high correlations of this kind when the scores that form the unit of analysis are at the whole unit level. Previous analyses indicate that when the individual respondent, or the face to face work group, are the unit of analysis, relationships are, as one would expect,

considerably lower (Bowers, 1973). This no doubt reflects in part the tendency for units to attain, over time, an internal consistency of their management practices.

Table 5

Wave 01

| | DM | M | HR | F T | SS | STC | STE | SGE | SWF | PS | PTC | PTE | PGE | PWF | PC | WGR | DIS | SAT | LLI | TNG | EEO | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CF | .92 | .92 | .93 | .88 | .72 | .77 | .78 | .69 | .79 | .67 | .76 | .81 | .74 | .82 | .75 | .32 | .67 | .78 | .76 | .80 | .87 | -- |
| DM | | .91 | .94 | .91 | .62 | .64 | .72 | .60 | .69 | .59 | .66 | .74 | .60 | .72 | .61 | .15 | .55 | .68 | .81 | .76 | .83 | -- |
| M | | | .94 | .89 | .71 | .73 | .79 | .71 | .77 | .67 | .74 | .82 | .73 | .80 | .73 | .24 | .65 | .81 | .82 | .80 | .86 | -- |
| HR | | | | .89 | .68 | .72 | .74 | .63 | .75 | .60 | .71 | .78 | .70 | .79 | .68 | .22 | .65 | .76 | .79 | .79 | .84 | -- |
| F T | | | | | .73 | .77 | .79 | .69 | .80 | .69 | .76 | .78 | .80 | .80 | .78 | .38 | .74 | .84 | .83 | .73 | .86 | -- |
| SS | | | | | | .94 | .84 | .76 | .90 | .81 | .81 | .74 | .78 | .79 | .83 | .44 | .74 | .81 | .58 | .60 | .78 | -- |
| STC | | | | | | | .90 | .82 | .93 | .81 | .84 | .81 | .86 | .85 | .86 | .50 | .79 | .84 | .60 | .69 | .81 | -- |
| STE | | | | | | | | .87 | .90 | .77 | .81 | .83 | .76 | .84 | .80 | .40 | .69 | .75 | .72 | .70 | .78 | -- |
| SGE | | | | | | | | | .82 | .76 | .74 | .73 | .78 | .76 | .81 | .49 | .73 | .76 | .59 | .61 | .71 | -- |
| SWF | | | | | | | | | | .75 | .80 | .80 | .82 | .85 | .84 | .46 | .71 | .84 | .65 | .75 | .79 | -- |
| PS | | | | | | | | | | | .92 | .82 | .83 | .85 | .90 | .55 | .76 | .77 | .65 | .54 | .75 | -- |
| PTC | | | | | | | | | | | | .91 | .84 | .92 | .92 | .54 | .73 | .77 | .65 | .65 | .81 | -- |
| PTE | | | | | | | | | | | | | .87 | .95 | .86 | .45 | .73 | .79 | .74 | .76 | .82 | -- |
| PGE | | | | | | | | | | | | | | .88 | .91 | .63 | .88 | .90 | .51 | .78 | .84 | -- |
| PWF | | | | | | | | | | | | | | | .91 | .49 | .75 | .82 | .73 | .80 | .84 | -- |
| PC | | | | | | | | | | | | | | | | .67 | .78 | .86 | .59 | .72 | .84 | -- |
| WGR | | | | | | | | | | | | | | | | | .53 | .52 | .09 | .45 | .46 | -- |
| DISC | | | | | | | | | | | | | | | | | | .81 | .41 | .57 | .74 | -- |
| SAT | | | | | | | | | | | | | | | | | | | .56 | .80 | 87 | -- |
| LLI | | | | | | | | | | | | | | | | | | | | .78 | .82 | -- |
| TNG | | | | | | | | | | | | | | | | | | | | | .76 | -- |
| EEO | | | | | | | | | | | | | | | | | | | | | | |
| D | | | | | | | | | | | | | | | | | | | | | | |

See Table 3 for listing of full index names

Table 6

Wave 02

| | DM | M | HR | F T | SS | STC | STE | SGE | SWF | PS | PTC | PTE | PGE | PWF | PC | WGR | DIS | SAT | LLI | TNG | EEO | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CF | .93 | .89 | .89 | .82 | .73 | .78 | .72 | .66 | .76 | .59 | .67 | .64 | .73 | .74 | .69 | .39 | .71 | .84 | .68 | .69 | .86 | |
| DM | | .91 | .93 | .86 | .66 | .72 | .69 | .64 | .72 | .49 | .57 | .65 | .69 | .69 | .62 | .33 | .72 | .82 | .68 | .68 | .81 | |
| M | | | .93 | .86 | .75 | .79 | .75 | .69 | .78 | .56 | .65 | .74 | .79 | .74 | .68 | .35 | .76 | .91 | .72 | .73 | .83 | |
| HR | | | | .79 | .66 | .73 | .69 | .59 | .69 | .43 | .54 | .71 | .69 | .72 | .54 | .25 | .68 | .79 | .76 | .72 | .80 | |
| F T | | | | | .75 | .75 | .72 | .79 | .79 | .65 | .73 | .72 | .78 | .71 | .79 | .53 | .80 | .87 | .56 | .69 | .83 | |
| SS | | | | | | .93 | .75 | .78 | .86 | .74 | .79 | .69 | .84 | .78 | .79 | .49 | .76 | .85 | .59 | .62 | .82 | |
| STC | | | | | | | .87 | .82 | .91 | .73 | .80 | .74 | .86 | .85 | .77 | .41 | .77 | .85 | .66 | .67 | .84 | |
| STE | | | | | | | | .86 | .88 | .65 | .73 | .76 | .79 | .78 | .72 | .41 | .72 | .79 | .61 | .68 | .71 | |
| SGE | | | | | | | | | .86 | .76 | .80 | .71 | .80 | .70 | .83 | .57 | .76 | .79 | .41 | .63 | .72 | |
| SWF | | | | | | | | | | .72 | .78 | .69 | .81 | .81 | .79 | .47 | .72 | .86 | .58 | .71 | .79 | |
| PS | | | | | | | | | | | .93 | .55 | .76 | .71 | .87 | .61 | .67 | .73 | .33 | .41 | .73 | |
| PTC | | | | | | | | | | | | .71 | .86 | .81 | .94 | .68 | .74 | .82 | .43 | .59 | .79 | |
| PTE | | | | | | | | | | | | | .88 | .83 | .72 | .48 | .69 | .78 | .69 | .78 | .71 | |
| PGE | | | | | | | | | | | | | | .92 | .88 | .61 | .82 | .89 | .66 | .75 | .82 | |
| PWF | | | | | | | | | | | | | | | .80 | .51 | .70 | .83 | .77 | .75 | .82 | |
| PC | | | | | | | | | | | | | | | | .76 | .75 | .85 | .43 | .68 | .79 | |
| WGR | | | | | | | | | | | | | | | | | .59 | .54 | .12 | .53 | .55 | |
| DISC | | | | | | | | | | | | | | | | | | .79 | .47 | .56 | .75 | |
| SAT | | | | | | | | | | | | | | | | | | | .66 | .77 | .87 | |
| LLI | | | | | | | | | | | | | | | | | | | | .65 | .65 | |
| TNG | | | | | | | | | | | | | | | | | | | | | .69 | |
| EEO | | | | | | | | | | | | | | | | | | | | | | |
| D | | | | | | | | | | | | | | | | | | | | | | |

See Table 3 for listing of full index names

Table 7

Wave 1 vs Wave 2

| | |
|---|---|
| CF | .66 |
| DM | .58 |
| M | .74 |
| HR | .67 |
| F T | .69 |
| SS | .74 |
| STC | .74 |
| STE | .66 |
| SGE | .74 |
| SWF | .71 |
| PS | .65 |
| PTC | .69 |
| PTE | .61 |
| PGE | .70 |
| PWF | .75 |
| PC | .73 |
| WGR | .64 |
| DISC | .76 |
| SAT | .74 |
| LLI | .49 |
| TNG | .65 |
| EEO | .81 |
| D | 0 |

See Table 3 for listing of full index names

## Relationships to Reenlistment Rate

Table 8 presents relationships of Wave 1 NHRMS indexes to first-term reenlistment rate. Table 9 presents relationships of these same Wave 1 NHRMS indexes to total reenlistment rate. The findings are reassuringly similar to those obtained in an earlier study of these same variables (Franklin and Drexler, 1976). As in that earlier study, the relationships in time periods preceding T0 are smaller. Also consistent with the earlier findings, relationships for periods more or less contemporaneous to the first survey wave and for a period approximately ten months subsequent to that first survey date are evident in strong and directionally appropriate coefficients. Thus, in this study as in the earlier analysis, we find evidence of the lagged "two-hump" pattern of relationship. The first peak of relationship represents concurrent effects upon reenlistment; the second hump represents lagged, or predictive, effects upon subsequent reenlistment rates. This two-humped, or lagged relationship pattern has been demonstrated repeatedly in civilian analyses as well (Pecorella, et al., 1978; Denison, 1982).

An interesting observation is the relative time consistency of these findings with those of the earlier Franklin and Drexler study. In the latter, the peak of relationship occurred in the time period representing 8 to 11 months subsequent to the first survey wave. Since, in that study, there were available data for only one

Table 8
Reenlistment and HRMS Indexes:

Correlations for First-Term Reenlistment

| VARIABLE | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5092.FTM8 | -0. (1) | -0. (1) | -0 (1) | -0. (1) | -0. (1) | -0. (1) | -0 (1) | -0. (1) | -0 (1) | -0 (1) | -0. (1) | -0. (1) |
| 5093.FTM7 | .1857 (3) | -.6329 (3) | -.4718 (3) | -.9388 (3) | .3341 (3) | .4648 (3) | .4351 (3) | .2770 (3) | .2212 (3) | .3721 (3) | .4267 (3) | .3383 (3) |
| 5094.FTM6 | .0906 (8) | -.3047 (8) | -.1403 (8) | -.4415 (8) | .0232 (8) | .1975 (8) | .2597 (8) | .3306 (8) | .4141 (8) | .4121 (8) | .3826 (8) | .3042 (8) |
| 5095.FTM5 | -.1307 (16) | -.0736 (16) | -.1402 (16) | .0564 (16) | .1344 (16) | .0564 (16) | -.0607 (16) | -.2830 (16) | -.0715 (16) | -.2016 (16) | -.2267 (16) | -.1545 (16) |
| 5096.FTM4 | -.2378 (28) | -.2965 (28) | -.2208 (28) | -.2627 (28) | -.2238 (28) | -.1758 (28) | .0124 (28) | -.0001 (28) | -.2101 (28) | -.0203 (28) | .1857 (28) | .2340 (28) |
| 5097.FTM3 | -.1669 (39) | -.1399 (39) | -.1343 (39) | -.1533 (39) | -.1414 (39) | .0340 (39) | -.0154 (39) | -.0483 (39) | .0249 (39) | -.0018 (39) | -.1071 (39) | -.0167 (39) |
| 5098.FTM2 | .0206 (63) | .0312 (63) | -.0091 (63) | -.0312 (63) | .0305 (63) | .1057 (63) | .1098 (63) | .0365 (63) | .1857 (63) | .1047 (63) | .2324 (63) | .2094 (63) |
| 5099.FTM1 | -.0848 (63) | -.0698 (63) | -.0831 (63) | -.1323 (63) | -.0076 (63) | -.0823 (63) | -.0296 (63) | -.0908 (63) | .0271 (63) | -.0119 (63) | .0882 (63) | .1357 (63) |
| 5100.FTO | .3428 (95) | .2731 (95) | .2675 (95) | .2355 (95) | .3055 (95) | .2318 (95) | .2082 (95) | .2078 (95) | .2440 (95) | .2844 (95) | .2383 (95) | .2951 (95) |
| 5101.FT1 | .1164 (91) | .0908 (91) | -.0022 (91) | .0532 (91) | .1101 (91) | .1468 (91) | .1349 (91) | .0640 (91) | .1530 (91) | .1326 (91) | .2057 (91) | .2338 (91) |
| 5102.FT2 | .1788 (98) | .1421 (98) | .0744 (98) | .1437 (98) | .1483 (98) | .0922 (98) | .1100 (98) | .1082 (98) | .0792 (98) | .1502 (98) | .0528 (98) | .1296 (98) |
| 5103.FT3 | .3106 (100) | .2105 (100) | .1638 (100) | .2001 (100) | .2225 (100) | .2839 (100) | .2736 (100) | .2376 (100) | .2707 (100) | 2669 (100) | .2469 (100) | .3032 (100) |
| 5104.FT4 | .0950 (91) | .0708 (91) | .0991 (91) | .0847 (91) | .1486 (91) | .1681 (91) | .1989 (91) | .1065 (91) | .1321 (91) | .1824 (91) | .2724 (91) | .3578 (91) |
| 5105.FT5 | .0713 (88) | .0458 (88) | .0257 (88) | .0703 (88) | .1392 (88) | .1820 (88) | .1685 (88) | .1297 (88) | .1211 (88) | .1734 (88) | .2083 (88) | .2879 (88) |
| 5106.FT6 | .1512 (65) | .0829 (65) | .1401 (65) | .1187 (65) | .2132 (65) | .2514 (65) | .2176 (65) | .1912 (65) | .2271 (65) | .2940 (65) | .3062 (65) | .3208 (65) |
| 5107.FT7 | .3502 (54) | .2045 (54) | .1160 (54) | .1789 (54) | .1482 (54) | .2204 (54) | .1858 (54) | .0675 (54) | .1602 (54) | .1977 (54) | .2805 (54) | .3619 (54) |
| 5108.FT8 | .2363 (33) | .0765 (33) | .0383 (33) | .1412 (33) | .1281 (33) | .1694 (33) | .0676 (33) | .0366 (33) | .0700 (33) | .2700 (33) | -.0616 (33) | .1347 (33) |
| 5109.FT9 | -.0628 (29) | -.2833 (29) | -.3641 (29) | -.2656 (29) | -.2310 (29) | -.1903 (29) | -.2208 (29) | -.2655 (29) | -.2119 (29) | -.2063 (29) | .0823 (29) | .1417 (29) |
| | 127. | 128. | 129. | 130. | 131. | 133. | 134 | 135 | 136. | 137. | 138. | 139 |

1 COMM F 2 DEC MA 3 MOTIVA 4 HUM RE 5 FAIR-E 7 SUP SU 8 SUP TE 9 SUP TE 10 SUP G 11 SUP W 12 WKGRP 13 WKGRP

Table 8 (Continued)

| Variable | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 5092 FTM8 | -0. (1) | -0. (1) | -0. (1) | -0. (1) | -0. (1) | -0. (1) | -0. (1) | -0. (1) | -0. (1) | -0. (1) |
| 5093.FTM7 | -.8897 (3) | .3641 (3) | -.0795 (3) | .4831 (3) | 1.0000 (2) | .5298 (3) | .3127 (3) | -.8410 (3) | -.9925 (3) | -.1025 (3) |
| 5094.FTM6 | -.5993 (8) | .2285 (8) | -.1633 (8) | .3881 (8) | .4350 (8) | .2436 (8) | .3145 (8) | -.5992 (8) | -.5295 (8) | -.0958 (8) |
| 5095.FTM5 | .2436 (16) | -.0017 (16) | -.1297 (16) | -.0495 (16) | .0426 (15) | .0300 (16) | -.1291 (16) | .1833 (16) | .2341 (16) | .0687 (16) |
| 5096.FTM4 | -.0858 (28) | -.0274 (28) | .1597 (28) | .0111 (28) | .0153 (25) | -.2137 (28) | -.1210 (28) | -.0591 (28) | -.2211 (28) | -.0883 (28) |
| 5097.FTM3 | -.0472 (39) | -.0490 (39) | -.0718 (39) | -.0158 (39) | .2231 (36) | .0126 (39) | -.0737 (39) | -.1787 (39) | -.0419 (39) | -.1440 (39) |
| 5098.FTM2 | .0347 (63) | .0652 (63) | .0275 (63) | .1587 (63) | .0017 (58) | .0886 (63) | .0618 (63) | -.1392 (63) | -.1172 (63) | .0451 (63) |
| 5099.FTM1 | -.0738 (63) | .0547 (63) | -.0005 (63) | .1229 (63) | .3229 (56) | .0395 (63) | .0054 (63) | -.2275 (63) | .0385 (63) | -.0036 (63) |
| 5100.FTO | .1951 (95) | .3107 (95) | .3540 (95) | .3497 (95) | .3242 (85) | .1913 (95) | .3175 (95) | .1875 (95) | .4054 (95) | .4020 (95) |
| 5101.FT1 | .1765 (91) | .2166 (91) | .1850 (91) | .3053 (91) | .4367 (81) | .1937 (91) | .1255 (91) | .0531 (91) | .2908 (91) | .2512 (91) |
| 5102.FT2 | .1060 (98) | .1173 (98) | .2100 (98) | .1496 (98) | .3052 (88) | .0458 (98) | .1123 (98) | .1412 (98) | .2660 (98) | .2536 (98) |
| 5103.FT3 | .2807 (100) | .2873 (100) | .3148 (100) | .3319 (100) | .4305 (87) | .2152 (100) | .2126 (100) | .1724 (100) | .4427 (100) | .3720 (100) |
| 5104.FT4 | .3139 (91) | .3090 (91) | .3504 (91) | .3223 (91) | .3975 (81) | .1206 (91) | .2012 (91) | .1767 (91) | .2657 (91) | .3016 (91) |
| 5105.FT5 | .2607 (88) | .2371 (88) | .2894 (88) | .2765 (88) | .4994 (77) | .1590 (88) | .1602 (88) | .2188 (88) | .2770 (88) | .2278 (88) |
| 5106.FT6 | .2221 (65) | .2753 (65) | .2779 (65) | .3524 (65) | .4806 (58) | .2113 (65) | .2358 (65) | .1474 (65) | .3474 (65) | .2415 (65) |
| 5107.FT7 | .2882 (54) | .3478 (54) | .4061 (54) | .4089 (54) | .5921 (49) | .2765 (54) | .2464 (54) | .2572 (54) | .5202 (54) | .3509 (54) |
| 5108.FT8 | .0771 (33) | .1041 (33) | .2603 (33) | .2300 (33) | .6199 (30) | .0204 (33) | .1258 (33) | .2200 (33) | .5044 (33) | .2771 (33) |
| 5109.FT9 | -.0291 (29) | -.0155 (29) | .1430 (29) | .1329 (29) | .5189 (26) | -.2952 (29) | -.2890 (29) | -.1146 (29) | .2547 (29) | -.1472 (29) |
| | 140. 14 WKGRP | 141. 15 WKGRP | 142. 16 WKGRP | 143. 17 WKGRP | 144. 18 WKGRP | 145. 19 WKGRP | 146. 20 SATIS | 147. 21 LOWER | 148. 22 TRAIN | 149. 23 EQUAL |

Table 9

Reenlistment and HRMS Indexes

Correlations for Total Reenlistment

| VARIABLE | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5192.TTM8 | -0. (1) | -0. (1) | -0. (1) | -0 (1) | -0 (1) | -0 (1) | 0 (1) | -0 (1) | -0 (1) | -0. (1) | -0. (1) | -0. (1) |
| 5193.TTM7 | -.1242 (4) | -.6886 (4) | -.7715 (4) | -.9332 (4) | -.4253 (4) | -.4577 (4) | -.3662 (4) | -.1828 (4) | -.0727 (4) | -.0596 (4) | .3508 (4) | .1693 (4) |
| 5194.TTM6 | .5626 (11) | .4860 (11) | .5199 (11) | .3764 (11) | .6005 (11) | .5900 (11) | .6543 (11) | .5300 (11) | .5574 (11) | .4414 (11) | .4104 (11) | .5246 (11) |
| 5195.TTM5 | .0290 (20) | .0876 (20) | -.0085 (20) | .0763 (20) | .1618 (20) | -.0335 (20) | -.0552 (20) | -.1938 (20) | .0097 (20) | -.1038 (20) | -.1075 (20) | -.0099 (20) |
| 5196.TTM4 | .3490 (37) | .2707 (37) | .3179 (37) | .2703 (37) | .2526 (37) | .3248 (37) | .4174 (37) | .4470 (37) | .2264 (37) | .3521 (37) | .3795 (37) | .4537 (37) |
| 5197.TTM3 | .0542 (49) | .0804 (49) | .1047 (49) | .1270 (49) | .0271 (49) | .0436 (49) | .0369 (49) | .0493 (49) | .0269 (49) | -.0401 (49) | .0365 (49) | .0179 (49) |
| 5198.TTM2 | .0545 (77) | .0515 (77) | -.0177 (77) | -.0126 (77) | .0581 (77) | .1453 (77) | .1632 (77) | .1051 (77) | .2148 (77) | .1817 (77) | .1869 (77) | .1970 (77) |
| 5199.TTM1 | .2163 (84) | .2394 (84) | .1787 (84) | .1597 (84) | .2401 (84) | .1259 (84) | .1466 (84) | .1558 (84) | .1797 (84) | .2228 (84) | .2058 (84) | .2720 (84) |
| 5200.TTO | .2774 (117) | .2808 (117) | .2937 (117) | .2200 (117) | .2670 (117) | .2419 (117) | .2046 (117) | .2334 (117) | .2226 (117) | .2818 (117) | .2889 (117) | .3219 (117) |
| 5201.TT1 | .1678 (111) | .1636 (111) | .1076 (111) | .1414 (111) | .1612 (111) | .1158 (111) | .1302 (111) | .1152 (111) | .1626 (111) | .1483 (111) | .1503 (111) | .1961 (111) |
| 5202.TT2 | .2975 (114) | .3057 (114) | .2189 (114) | .2560 (114) | .2314 (114) | .1415 (114) | .1943 (114) | .2251 (114) | .1712 (114) | .2352 (114) | .1283 (114) | .2122 (114) |
| 5203.TT3 | .2831 (116) | .2319 (116) | .2099 (116) | .2386 (116) | .2868 (116) | .2744 (116) | .2350 (116) | .2733 (116) | .2987 (116) | .3071 (116) | .2498 (116) | .3260 (116) |
| 5204.TT4 | .3311 (109) | .3511 (109) | .3554 (109) | .3373 (109) | .3504 (109) | .3226 (109) | .4033 (109) | .3447 (109) | .3233 (109) | .3544 (109) | .4271 (109) | .4958 (109) |
| 5205.TT5 | .1465 (100) | .1163 (100) | .1121 (100) | .1425 (100) | .1482 (100) | .1801 (100) | .1904 (100) | .1693 (100) | .1680 (100) | .2126 (100) | .1780 (100) | .2577 (100) |
| 5206.TT6 | .2137 (76) | .1469 (76) | .1932 (76) | .1687 (76) | .2586 (76) | .2761 (76) | .2973 (76) | .2636 (76) | .2914 (76) | .3248 (76) | .2856 (76) | .3364 (76) |
| 5207.TT7 | .3686 (63) | .2886 (63) | .2091 (63) | .2575 (63) | .1833 (63) | .1933 (63) | .1903 (63) | .1740 (63) | .2475 (63) | .2266 (63) | .2297 (63) | .3314 (63) |
| 5208.TT8 | .3589 (39) | .2621 (39) | .2290 (39) | .3186 (39) | .3015 (39) | .2483 (39) | .2273 (39) | .2751 (39) | .2337 (39) | .3679 (39) | .0594 (39) | .2673 (39) |
| 5209.TT9 | -.0423 (31) | -.1946 (31) | -.2130 (31) | -.0932 (31) | -.0878 (31) | -.2246 (31) | -.2160 (31) | -.1195 (31) | -.1602 (31) | -.2459 (31) | .0808 (31) | .0579 (31) |
| | 127. | 128. | 129. | 130. | 131. | 133. | 134. | 135. | 136. | 137. | 138. | 139. |
| | 1 COMM F | 2 DEC MA | 3 MOTIVA | 4 HUM RE | 5 FAIR-E | 7 SUP SU | 8 SUP TE | 9 SUP TE | 10 SUP G | 11 SUP W | 12 WKGRP | 13 WKGRP |

Table 4 (Continued)

| Variable | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 5192.TTM8 | -0. (1) | -0. (1) | -0. (1) | -0. (1) | -0. (1) | -0. (1) | -0. (1) | -0. (1) | -0. (1) | -0. (1) |
| 5193.TTM7 | -.9229 (4) | -.4547 (4) | -.6231 (4) | .2628 (4) | .6622 (3) | -.3543 (4) | -.1401 (4) | -.9285 (4) | -.9185 (4) | -.1880 (4) |
| 5194.TTM6 | .1520 (11) | .6804 (11) | .5619 (11) | .5394 (11) | .5751 (10) | .6988 (11) | .5035 (11) | .1552 (11) | .2363 (11) | .4108 (11) |
| 5195.TTM5 | .0755 (20) | -.0018 (20) | -.1939 (20) | .0721 (20) | .1123 (16) | .1486 (20) | -.0871 (20) | -.0696 (20) | .1167 (20) | .1122 (20) |
| 5196.TTM4 | .2721 (37) | .4003 (37) | .4877 (37) | .3267 (37) | .2855 (33) | .2798 (37) | .3392 (37) | .2268 (37) | .2092 (37) | .3350 (37) |
| 5197.TTM3 | .1690 (49) | .1135 (49) | .0474 (49) | -.0057 (49) | .1684 (43) | .1401 (49) | -.0007 (49) | .0374 (49) | -.0622 (49) | -.0143 (49) |
| 5198.TTM2 | .0723 (77) | .1464 (77) | .1191 (77) | .2181 (77) | .1615 (69) | .1048 (77) | .1270 (77) | -.0707 (77) | .0890 (77) | .1481 (77) |
| 5199.TTM1 | .1367 (84) | .2030 (84) | .1598 (84) | .2740 (84) | .3419 (75) | .1845 (84) | .2132 (84) | -.0124 (84) | .1977 (84) | .2529 (84) |
| 5200.TTO | .2558 (117) | .3480 (117) | .3578 (117) | .3680 (117) | .3098 (101) | .2920 (117) | .3806 (117) | .2106 (117) | .3354 (117) | .3515 (117) |
| 5201.TT1 | .1707 (111) | .2333 (111) | .2125 (111) | .2387 (111) | .3113 (96) | .2472 (111) | .1780 (111) | .0644 (111) | .2607 (111) | .2225 (111) |
| 5202.TT2 | .2028 (114) | .2251 (114) | .2841 (114) | .2256 (114) | .3236 (100) | .1831 (114) | .2569 (114) | .1640 (114) | .3519 (114) | .2919 (114) |
| 5203.TT3 | .3315 (116) | .3238 (116) | .3374 (116) | .3536 (116) | .3778 (100) | .2733 (116) | .2601 (116) | .1959 (116) | .4155 (116) | .3790 (116) |
| 5204.TT4 | .4754 (109) | .4615 (109) | .4733 (109) | .4269 (109) | .3953 (93) | .4002 (109) | .4196 (109) | .2827 (109) | .3764 (109) | .4501 (109) |
| 5205.TT5 | .2435 (100) | .2323 (100) | .2857 (100) | .2376 (100) | .4140 (87) | .2426 (100) | .2030 (100) | .2598 (100) | .2700 (100) | .2146 (100) |
| 5206.TT6 | .3068 (76) | .3467 (76) | .3874 (76) | .3763 (76) | .5033 (67) | .3275 (76) | .3270 (76) | .1848 (76) | .3724 (76) | .3018 (76) |
| 5207.TT7 | .3439 (63) | .3848 (63) | .4045 (63) | .3821 (63) | .4420 (55) | .3428 (63) | .3013 (63) | .2868 (63) | .4694 (63) | .3140 (63) |
| 5208.TT8 | .2931 (39) | .2817 (39) | .3722 (39) | .3046 (39) | .5180 (34) | .2093 (39) | .3294 (39) | .3228 (39) | .5593 (39) | .3498 (39) |
| 5209.TT9 | .1026 (31) | .0894 (31) | .1262 (31) | .0597 (31) | .3226 (26) | .0460 (31) | -.1611 (31) | -.0754 (31) | .1950 (31) | -.0978 (31) |
| | 140. 14 WKGRP | 141. 15 WKGRP | 142. 16 WKGRP | 143. 17 WKGRP | 144. 18 WKGRP | 145. 19 WKGRP | 146. 20 SATIS | 147. 21 LOWER | 148. 22 TRAIN | 149. 23 EQUAL |

additional time period beyond the 8th to the 11th subsequent months, any subsequent rise or fall was untracked. In the present study, there is ,indeed, a relationship peak in period T+3, which corresponds approximately to Franklin and Drexler's T+2 period.

However, in the present study, time periods extend on out as far as 27 months subsequent to the first survey wave, and we can observe yet another rise to a peak in period T+7, 21 months following.

Relationships to total reenlistment rate are similar to those for first-term reenlistment. They are, if anything, perhaps a bit stronger, in particular in time period T+8, and they display the same relatively mixed pattern in time period T+9 that is present for relationships to first-term reenlistment rate.

Unauthorized Absence and Desertion Rates

Two variables were formed for each unit on unauthorized absences and desertions. First, rate of unauthorized absences was calculated by dividing the unit's total number of UA's for each time period by that unit's E1-E7 complement. Second, rate of desertion occurring in a given time period was similarly calculated. As described earlier in the report, these rates were standardized and relativized into six month periods which extend from about a year prior to the unit's Wave 1 NHRMS survey date to about three years following that survey wave. Tables 10A-10C present intercorrelations of UA rates and desertion rates among time

Table 10A

Correlations between Standardized, Relativized UA Measures

| VARIABLE | 4303. UASM3 | 4304. UASM2 | 4305. UASM1 | 4306. UASO | 4307. UAS1 | 4308. UAS2 | 4309. UAS3 | 4310. UAS4 | 4311. UAS5 | 4312. UAS6 |
|---|---|---|---|---|---|---|---|---|---|---|
| 4303.UASM3 | 1.0000 | | | | | | | | | |
| 4304.UASM2 | .6175 (4) | 1.0000 | | | | | | | | |
| 4305.UASM1 | .3248 (4) | .7124 (26) | 1.0000 | | | | | | | |
| 4306.UASO | .0760 (4) | .5869 (26) | .5640 (65) | 1.0000 | | | | | | |
| 4307.UAS1 | -.9211 (4) | .5582 (26) | .4600 (65) | .5488 (107) | 1.0000 | | | | | |
| 4308.UAS2 | .5748 (4) | .3965 (26) | .4315 (65) | .5435 (107) | .7563 (141) | 1.0000 | | | | |
| 4309.UAS3 | -0. | .4727 (22) | .4153 (61) | .5845 (103) | .5415 (137) | .5508 (137) | 1.0000 | | | |
| 4310.UAS4 | -0. | -0. | .3533 (39) | .2944 (81) | .3368 (115) | .2981 (115) | .4275 (115) | 1.0000 | | |
| 4311.UAS5 | -0. | -0. | -0. | .4213 (42) | .6508 (76) | .6135 (76) | .5161 (76) | .5550 (76) | 1.0000 | |
| 4312.UAS6 | -0. | -0. | -0. | -0. | .5001 (34) | .5555 (34) | .2644 (34) | .1933 (34) | .6891 (34) | 1.0000 |

Table 10B

Correlations between Standardized, Relativized Desertion Measures

| VARIABLE | 4403. DXSM3 | 4404. DXSM2 | 4405. DXSM1 | 4406. DXSO | 4407. DXS1 | 4408. DXS2 | 4409. DXS3 | 4410. DXS4 | 4411. DXS5 | 4412. DXS6 |
|---|---|---|---|---|---|---|---|---|---|---|
| 4403.DXSM3 | 1.0000 | | | | | | | | | |
| 4404.DXSM2 | .9259 (4) | 1.0000 | | | | | | | | |
| 4405.DXSM1 | .7663 (4) | .4898 (26) | 1.0000 | | | | | | | |
| 4406.DXSO | .7776 (4) | .8305 (26) | .6793 (65) | 1.0000 | | | | | | |
| 4407.DXS1 | .6877 (4) | .7512 (26) | .5724 (65) | .7757 (107) | 1.0000 | | | | | |
| 4408.DXS2 | .3081 (4) | .5864 (26) | .5524 (65) | .6738 (107) | .7270 (141) | 1.0000 | | | | |
| 4409.DXS3 | -0. | .4018 (22) | .5659 (61) | .5229 (103) | .5903 (137) | .6023 (137) | 1.0000 | | | |
| 4410.DXS4 | -0. | -0. | .6375 (39) | .7775 (81) | .6001 (115) | .7312 (115) | .6186 (115) | 1.0000 | | |
| 4411.DXS5 | -0. | -0. | -0. | .6742 (42) | .5211 (76) | .6591 (76) | .5917 (76) | .6704 (76) | 1.0000 | |
| 4412.DXS6 | -0. | -0. | -0. | -0. | .2685 (34) | .5785 (34) | .4661 (34) | .3039 (34) | .6080 (34) | 1.0000 |

Table 10C

Correlations between Desertion and UA

(using the standardized, relativized measures)

| VARIABLE | 4303. UASM3 | 4304. UASM2 | 4305. UASM1 | 4306. UAS0 | 4307. UAS1 | 4308. UAS2 | 4309. UAS3 | 4310. UAS4 | 4311. UAS5 | 4312. UAS6 |
|---|---|---|---|---|---|---|---|---|---|---|
| 4403.DXSM3 | .5935 (4) | .7533 (4) | .3852 (4) | .7861 (4) | -.4257 (4) | .5932 (4) | -0. | -0. | -0. | -0. |
| 4404.DXSM2 | .7464 (4) | .6727 (26) | .2060 (26) | .3797 (26) | .6554 (26) | .4468 (26) | .4906 (22) | -0. | -0. | -0. |
| 4405.DXSM1 | .2146 (4) | .7035 (26) | .6697 (65) | .6079 (65) | .4613 (65) | .4577 (65) | .4629 (61) | .0591 (39) | -0. | -0. |
| 4406.DXSO | .0665 (4) | .6821 (26) | .4835 (65) | .6530 (107) | .6198 (107) | .5603 (107) | .5275 (103) | .3029 (81) | .5764 (42) | -0. |
| 4407.DXS1 | .0298 (4) | .7175 (26) | .4830 (65) | .5086 (107) | .6752 (141) | .5816 (141) | .4319 (137) | .2347 (115) | .6612 (76) | .5413 (34) |
| 4408.DXS2 | -.0084 (4) | .3799 (26) | .3678 (65) | .4504 (107) | .7212 (141) | .6972 (141) | .3897 (137) | .2138 (115) | .6213 (76) | .6579 (34) |
| 4409.DXS3 | -0. | .3187 (22) | .3720 (61) | .4934 (103) | .6143 (137) | .6898 (137) | .6706 (137) | .2931 (115) | .6051 (76) | .4541 (34) |
| 4410.DXS4 | -0. | -0. | .3862 (39) | .5031 (81) | .5748 (115) | .5643 (115) | .4211 (115) | .3269 (115) | .5098 (76) | .2068 (34) |
| 4411.DXS5 | -0. | -0. | -0. | .3915 (42) | .5220 (76) | .5949 (76) | .3578 (76) | .4646 (76) | .6899 (76) | .6498 (34) |
| 4412.DXS6 | -0. | -0. | -0. | -0. | .3647 (34) | .4626 (34) | .1177 (34) | .1744 (34) | .6425 (34) | .7395 (34) |

periods. The data indicate that the relationships are relatively stable over time. Correlations are highest between contiguous time periods and range from .42 to .77. Correlations between more distant time periods are still, generally, well above .40. Correlations between UA rates and desertion rates are also consistently high for concurrent time periods, ranging from .33 to .74 and averaging .64.

Tables 11A-11B present correlations between UA and desertion rates, on the one hand, and NHRMS survey indexes on the other. Concerning unauthorized absence, the correlations between UA rates and survey indexes range from approximately -.07 to -.60, with most of the coefficients at a level of -.30 and higher. The relationship of the leads and lags in these correlations is interesting, showing strong correlations of Wave 1 NHRMS indexes to UA's in the following year to a year-and-a-half time period, and then again, to UA's in the period a year-and-a-half to two years following the Wave 1 survey.

Refresher Training (REFTRA)

Data on either full or interim REFTRA, matched with survey data, were available for a small number of units in the Pacific Fleet. Because REFTRA represents simulated battle conditions, these data are of high interest.

The match over time between the survey data and REFTRA is quite variable. REFTRA exercises often preceded both waves of survey data, or were ordered in some other manner

TABLE 11A

Correlations Between Unexcused Absence Rates*

and Wave 1 HRMS Indexes

| VARIABLE | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4003. UAM3 | -.4218 (4) | -.6968 (4) | -.4884 (4) | -.3432 (4) | -.2208 (4) | -.1106 (4) | -.1509 (4) | -.3274 (4) | -.3993 (4) | -.2569 (4) | -.2265 (4) | -.3130 (4) |
| 4004. UAM2 | -.4702 (26) | -.4790 (26) | -.4053 (26) | -.4111 (26) | -.3804 (26) | -.4734 (26) | -.5787 (26) | -.3924 (26) | -.3678 (26) | -.4119 (26) | -.3397 (26) | -.4640 (26) |
| 4005. UAM1 | -.3937 (65) | -.3794 (65) | -.3682 (65) | -.3663 (65) | -.4268 (65) | -.4850 (65) | -.4743 (65) | -.4145 (65) | -.4154 (65) | -.4059 (65) | -.3123 (65) | -.4259 (65) |
| 4006. UA0 | -.3795 (106) | -.3330 (106) | -.3817 (106) | -.2811 (106) | -.3495 (106) | -.5081 (106) | -.5077 (106) | -.4185 (106) | -.4057 (106) | -.4615 (106) | -.5741 (106) | -.5770 (106) |
| 4007. UA1 | -.3318 (140) | -.3277 (140) | -.3617 (140) | -.3390 (140) | -.3353 (140) | -.4695 (140) | -.4962 (140) | -.3612 (140) | -.3825 (140) | -.4289 (140) | -.4129 (140) | -.5103 (140) |
| 4008. UA2 | -.3660 (140) | -.3517 (140) | -.4336 (140) | -.3850 (140) | -.4144 (140) | -.5035 (140) | -.5057 (140) | -.3932 (140) | -.4318 (140) | -.4610 (140) | -.4288 (140) | -.5279 (140) |
| 4009. UA3 | -.3724 (136) | -.3562 (136) | -.4164 (136) | -.3798 (136) | -.4162 (136) | -.5168 (136) | -.5028 (136) | -.3870 (136) | -.4332 (136) | -.4517 (136) | -.4682 (136) | -.4702 (136) |
| 4010. UA4 | -.2902 (114) | -.2413 (114) | -.2194 (114) | -.2719 (114) | -.2494 (114) | -.2190 (114) | -.2549 (114) | -.2429 (114) | -.2263 (114) | -.2046 (114) | -.2418 (114) | -.2674 (114) |
| 4011. UA5 | -.3231 (75) | -.2953 (75) | -.3688 (75) | -.3553 (75) | -.3366 (75) | -.5043 (75) | -.4809 (75) | -.3024 (75) | -.3689 (75) | -.4225 (75) | -.5036 (75) | -.5641 (75) |
| 4012. UA6 | -.1770 (34) | -.1254 (34) | -.1717 (34) | -.2047 (34) | -.2723 (34) | -.2224 (34) | -.2051 (34) | -.1773 (34) | -.1691 (34) | -.2534 (34) | -.3101 (34) | -.4977 (34) |
| | 127. | 128. | 129. | 130. | 131. | 133. | 134. | 135. | 136. | 137. | 138. | 139. |
| | 1 COMM F | 2 DEC MA | 3 MOTIVA | 4 HUM RE | 5 FAIR-E | 7 SUP SU | 8 SUP TE | 9 SUP TE | 10 SUP G | 11 SUP W | 12 WKGRP | 13 WKGRP |

* Unexcused Absence rates are for 3 six-month periods preceding the survey (UAM3, UAM2, UAM1), a concurrent period (UA0), and 6 periods following the survey (UA1, UA2, etc.)

TABLE 11A (Continued)

| Variable | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4003. UAM3 | -.2798 | -.1896 | -.4113 | -.1621 | .5952 | -.0694 | -.3024 | -.2112 | -.4663 | -.6459 | -.8594 |
| | (4) | (4) | (4) | (4) | (3) | (4) | (4) | (4) | (4) | (4) | (4) |
| 4004. UAM2 | -.3338 | -.4267 | -.4880 | -.3784 | -.1625 | -.3965 | -.4322 | -.1734 | -.4332 | -.5324 | -.5140 |
| | (26) | (26) | (26) | (26) | (21) | (26) | (26) | (26) | (26) | (26) | (26) |
| 4005. UAM1 | -.4710 | -.5079 | -.4390 | -.4831 | -.3748 | -.4212 | -.4147 | -.2715 | -.4287 | -.4623 | -.4124 |
| | (65) | (65) | (65) | (65) | (51) | (65) | (65) | (65) | (65) | (65) | (65) |
| 4006. UA0 | -.3067 | -.5328 | -.4803 | -.5771 | -.4805 | -.4536 | -.5085 | -.1738 | -.3254 | -.5205 | -.4115 |
| | (106) | (106) | (106) | (106) | (87) | (106) | (106) | (106) | (106) | (106) | (106) |
| 4007. UA1 | -.4894 | -.5812 | -.5438 | -.5043 | -.4100 | -.4512 | -.4505 | -.3141 | -.4062 | -.4495 | -.3935 |
| | (140) | (140) | (140) | (140) | (115) | (140) | (140) | (140) | (140) | (140) | (140) |
| 4008. UA2 | -.5090 | -.5964 | -.5437 | -.5333 | -.4614 | -.4924 | -.5037 | -.3267 | -.4483 | -.4881 | -.3624 |
| | (140) | (140) | (140) | (140) | (115) | (140) | (140) | (140) | (140) | (140) | (140) |
| 4009. UA3 | -.4412 | -.5213 | -.4435 | -.4900 | -.3968 | -.4809 | -.4664 | -.3013 | -.3960 | -.4657 | -.4062 |
| | (136) | (136) | (136) | (136) | (112) | (136) | (136) | (136) | (136) | (136) | (136) |
| 4010. UA4 | -.2476 | -.2960 | -.2714 | -.2709 | -.3587 | -.2542 | -.2653 | -.2517 | -.2231 | -.2819 | -.3275 |
| | (114) | (114) | (114) | (114) | (94) | (114) | (114) | (114) | (114) | (114) | (114) |
| 4011. UA5 | -.4309 | -.5471 | -.5511 | -.5239 | -.5184 | -.4726 | -.4791 | -.4654 | -.3749 | -.4471 | -.3615 |
| | (75) | (75) | (75) | (75) | (64) | (75) | (75) | (75) | (75) | (75) | (75) |
| 4012. UA6 | -.4000 | -.4178 | -.4107 | -.4329 | -.5166 | -.2972 | -.2559 | -.1816 | -.2166 | -.1387 | -.1707 |
| | (34) | (34) | (34) | (34) | (28) | (34) | (34) | (34) | (34) | (34) | (34) |
| | 140. | 141. | 142. | 143. | 144. | 145. | 146. | 147. | 148. | 149. | 152. |
| | 14 WKGRP | 15 WKGRP | 16 WKGRP | 17 WKGRP | 18 WKGRP | 19 WKGRP | 20 SATIS | 21 LOWER | 22 TRAIN | 23 EQUAL | 26 PERSO |

TABLE 11B

Correlations Between Desertion Rates*

Wave 1 HRMS Indexes

| VARIABLE | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4103.DXM3 | -.9609 (4) | -.6525 (4) | -.6029 (4) | .1351 (4) | -.7890 (4) | -.7159 (4) | -.7816 (4) | -.9200 (4) | -.9635 (4) | -.9176 (4) | -.8938 (4) | -.9482 (4) |
| 4104.DXM2 | -.5162 (26) | -.5887 (26) | -.5392 (26) | -.4638 (26) | -.5468 (26) | -.4534 (26) | -.5494 (26) | -.4033 (26) | -.4315 (26) | -.4120 (26) | -.3101 (26) | -.4017 (26) |
| 4105.DXM1 | -.4787 (65) | -.4590 (65) | -.4567 (65) | -.4547 (65) | -.4790 (65) | -.5279 (65) | -.5504 (65) | -.4873 (65) | -.4381 (65) | -.4960 (65) | -.3984 (65) | -.4959 (65) |
| 4106.DX0 | -.4699 (106) | -.4434 (106) | -.4794 (106) | -.3976 (106) | -.5173 (106) | -.5841 (106) | -.6049 (106) | -.5175 (106) | -.5692 (106) | -.5680 (106) | -.5614 (106) | -.6228 (106) |
| 4107.DX1 | -.3352 (140) | -.3072 (140) | -.3696 (140) | -.3538 (140) | -.3487 (140) | -.4297 (140) | -.4814 (140) | -.3784 (140) | -.3833 (140) | -.4162 (140) | -.3717 (140) | -.4512 (140) |
| 4108.DX2 | -.3750 (140) | -.3574 (140) | -.4345 (140) | -.3932 (140) | -.4050 (140) | -.4364 (140) | -.4792 (140) | -.4262 (140) | -.4623 (140) | -.4672 (140) | -.4176 (140) | -.5132 (140) |
| 4109.DX3 | -.3767 (136) | -.3349 (136) | -.4128 (136) | -.3732 (136) | -.3851 (136) | -.5168 (136) | -.5351 (136) | -.4391 (136) | -.4674 (136) | -.4852 (136) | -.4641 (136) | -.5319 (136) |
| 4110.DX4 | -.3183 (114) | -.2528 (114) | -.3138 (114) | -.3125 (114) | -.3586 (114) | -.4501 (114) | -.4789 (114) | -.3469 (114) | -.4181 (114) | -.4278 (114) | -.5350 (114) | -.5500 (114) |
| 4111.DX5 | -.3134 (75) | -.2530 (75) | -.3048 (75) | -.3291 (75) | -.3017 (75) | -.3711 (75) | -.3357 (75) | -.2400 (75) | -.2595 (75) | -.2940 (75) | -.4206 (75) | -.5026 (75) |
| 4112.DX6 | -.1929 (34) | -.1168 (34) | -.1537 (34) | -.1705 (34) | -.1916 (34) | -.2063 (34) | -.1472 (34) | -.1327 (34) | -.1321 (34) | -.2039 (34) | -.3515 (34) | -.4374 (34) |
| | 127. | 128. | 129. | 130. | 131. | 133. | 134. | 135. | 136. | 137. | 138. | 139. |
| | 1 COMM F | 2 DEC MA | 3 MOTIVA | 4 HUM RE | 5 FAIR-E | 7 SUP SU | 8 SUP TE | 9 SUP TE | 10 SUP G | 11 SUP W | 12 WKGRP | 13 WKGRP |

*Desertion rates are for 3 six-month periods preceding the survey (DXM3, DXM2, DXM1), a concurrent period (DX0), and 6 six-month periods following the survey (DX1, DX2, etc.)

TABLE 11B (Continued)

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4103.DXM3 | .2254 | -.7593 | -.7368 | -.8826 | -.9998 | -.7412 | -.9208 | .2753 | -.0146 | -.9725 | -.9213 |
| | (4) | (4) | (4) | (4) | (3) | (4) | (4) | (4) | (4) | (4) | (4) |
| 4104.DXM2 | -.4146 | -.4891 | -.4233 | -.4229 | -.2359 | -.5032 | -.4931 | -.1800 | -.5047 | -.5169 | -.5054 |
| | (26) | (26) | (26) | (26) | (21) | (26) | (26) | (26) | (26) | (26) | (26) |
| 4105.DXM1 | -.4643 | -.5545 | -.5339 | -.5222 | -.3996 | -.4635 | -.5344 | -.3592 | -.5056 | -.5705 | -.4856 |
| | (65) | (65) | (65) | (65) | (51) | (65) | (65) | (65) | (65) | (65) | (65) |
| 4106.DX0 | -.4840 | -.6237 | -.5769 | -.6522 | -.4867 | -.5716 | -.5860 | -.3304 | -.4968 | -.6191 | -.4351 |
| | (106) | (106) | (106) | (106) | (87) | (106) | (106) | (106) | (106) | (106) | (106) |
| 4107.DX1 | -.4357 | -.5268 | -.5160 | -.4430 | -.3214 | -.4070 | -.4238 | -.3810 | -.4068 | -.4200 | -.3067 |
| | (140) | (140) | (140) | (140) | (115) | (140) | (140) | (140) | (140) | (140) | (140) |
| 4108.DX2 | -.5406 | -.5975 | -.5707 | -.5226 | -.3914 | -.4435 | -.5125 | -.3956 | -.4643 | -.4600 | -.3259 |
| | (140) | (140) | (140) | (140) | (115) | (140) | (140) | (140) | (140) | (140) | (140) |
| 4109.DX3 | -.5008 | -.5946 | -.5622 | -.5285 | -.3830 | -.4832 | -.4815 | -.3866 | -.4476 | -.4676 | -.3575 |
| | (136) | (136) | (136) | (136) | (112) | (136) | (136) | (136) | (136) | (136) | (136) |
| 4110.DX4 | -.4443 | -.5167 | -.5079 | -.5099 | -.3506 | -.3958 | -.4025 | -.3835 | -.3322 | -.4470 | -.3101 |
| | (114) | (114) | (114) | (114) | (94) | (114) | (114) | (114) | (114) | (114) | (114) |
| 4111.DX5 | -.4150 | -.4868 | -.4497 | -.4776 | -.4476 | -.3450 | -.3819 | -.4093 | -.3625 | -.3568 | -.3214 |
| | (75) | (75) | (75) | (75) | (64) | (75) | (75) | (75) | (75) | (75) | (75) |
| 4112.DX6 | -.3366 | -.3241 | -.3482 | -.3883 | -.4497 | -.2130 | -.2014 | -.2127 | -.1706 | -.1835 | -.1687 |
| | (34) | (34) | (34) | (34) | (28) | (34) | (34) | (34) | (34) | (34) | (34) |

| 140. | 141. | 142. | 143. | 144. | 145. | 146. | 147. | 148. | 149. | 152. |
|---|---|---|---|---|---|---|---|---|---|---|
| 14 WKGRP | 15 WKGRP | 16 WKGRP | 17 WKGRP | 18 WKGRP | 19 WKGRP | 20 SATIS | 21 LOWER | 22 TRAIN | 23 EQUAL | 26 PERSO |

that was less-than-desirable for this analysis. Accordingly, cases were included in this analysis if either a full or interim REFTRA took place within the time period extending from one year before to one year after either of the waves of survey data. This allowed for the analysis of 27 units, 16 of which had full REFTRAs and 11 of which had interim REFTRAs. The correlations between the survey measures and weighted REFTRA scores are presented in Table 12.

These analyses show a strong relationship between a number of the HRMS indexes and interim REFTRA scores, but no real relationship between HRMS indexes and full REFTRA scores. This reverses the pattern reported by Mumford (1976)[1]. Nonetheless, from this limited sample, Refresher Training performance appears to vary quite closely with human resource management practices aboard ship.

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[1] Mumford, S. 1976. Human resource management and operational readiness as measured by Refresher Training on Navy ships. Navy Personnel Research and Development Center.

TABLE 12

CORRELATIONS BETWEEN SURVEY MEASURES

AND WEIGHTED REFTRA SCORES

| Survey Measure | Interim REFTRA N=11 | Full REFTRA N=16 | Total N=27 |
|---|---|---|---|
| 127 Communication Flow | .3278 | .2070 | .2803 |
| 128 Decision-Making Practices | .5618 | .1719 | .2981 |
| 129 Motivational Conditions | .5968 | -.0164 | .1636 |
| 130 Human Resource Emphasis | .3313 | .0205 | .0971 |
| 131 Fair and Equitable Treatment | .4082 | .0348 | .1471 |
| 133 Supervisory Support | .2720 | -.2552 | -.0947 |
| 134 Sup Team Coordination | -.0202 | -.0949 | -.0876 |
| 135 Sup Team Emphasis | .4502 | -.0835 | .1378 |
| 136 Sup Goal Emphasis | .4378 | .3264 | .3301 |
| 137 Sup Work Facilitation | .6014 | -.0749 | .1684 |
| 138 Peer Support | .5012 | .1036 | .2098 |
| 139 Peer Team Coordination | .4413 | .0114 | .1473 |
| 140 Peer Team Emphasis | .4971 | -.0625 | .0533 |
| 141 Peer Goal Emphasis | .5112 | -.0007 | .2308 |
| 142 Peer Work Facilitation | .2322 | -.0067 | .1566 |
| 143 Peer Coordination | .4818 | .0547 | .2431 |
| 144 Work Group Readiness | .3423 | .1117 | .1723 |
| 145 Discipline | .4350 | .2277 | .2996 |
| 146 Satisfaction | .5823 | -.0201 | .1901 |
| 147 Lower Level Influence | .0196 | -.0348 | .0053 |
| 148 Training | .6908 | -.0523 | .1305 |
| 149 Equal Employment Opportunity | .4299 | .0975 | .1660 |

## Project Upgrade Percentages

To test possible organizational implications, or involvement, in the incidence of Upgrade cases, three Upgrade variables were constructed. First, the percentage of a unit's total complement of E-1's to E-7's who were discharged as part of the first Upgrade program was calculated. Second, the percentage discharged as part of the second Upgrade program was also calculated. Third, the percentage discharged as part of both Upgrade programs combined was calculated. An initial finding was that the Upgrade percentages for the first program correlated with those for the second Upgrade program .39. There is, therefore, some significant tendency for units which upgraded a higher percentage in the first Upgrade program also to have upgraded a higher percentage in the second Upgrade program.

Another finding is that there was no significant correlation of Upgrade percentage to the sheer size of the unit as measured by its N (r=.13).

Tables 13 and 14 present the correlation of project Upgrade percentages to Wave 1 NHRMS data, and Project Upgrade percentages to wave 2 NHRMS data, respectively. The findings present an interesting pattern. First, all three upgrade percentage variables correlate more strongly with the first wave of NHRMS indexes than with indexes from the second NHRMS wave. Correlations to indexes in both NHRMS waves range from about -.20 to -.53 and average around -.27.

Table 13

Correlations Between Upgrade Percentages

and Wave 1 NHRMS Indexes

| VARIABLE | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9006.PU1% | -.1321 (140) | -.1238 (140) | -.1410 (140) | -.1310 (140) | -.2203 (140) | -.2577 (140) | -.2562 (140) | -.1813 (140) | -.2370 (140) | -.1995 (140) | -.2994 (140) | -.3239 (140) |
| 9007.PU2% | -.2376 (140) | -.2229 (140) | -.2406 (140) | -.1496 (140) | -.4051 (140) | -.3911 (140) | -.3411 (140) | -.2869 (140) | -.4628 (140) | -.3817 (140) | -.5229 (140) | -.5076 (140) |
| 9008.PUTOT% | -.2280 (140) | -.2138 (140) | -.2349 (140) | -.1701 (140) | -.3860 (140) | -.3977 (140) | -.3643 (140) | -.2874 (140) | -.4328 (140) | -.3592 (140) | -.5066 (140) | -.5103 (140) |
| | 127. 1 COMM F | 128. 2 DEC MA | 129. 3 MOTIVA | 130. 4 HUM RE | 131. 5 FAIR-E | 133. 7 SUP SU | 134. 8 SUP TE | 135. 9 SUP TE | 136. 10 SUP G | 137. 11 SUP W | 138. 12 WKGRP | 139. 13 WKGRP |
| 9006.PU1% | -.2141 (140) | -.2705 (140) | -.2324 (140) | -.3085 (140) | -.3318 (115) | -.2756 (140) | -.2222 (140) | -.0573 (140) | -.2124 (140) | -.2480 (140) | -.1787 (89) | -.1949 (140) |
| 9007.PU2% | -.2359 (140) | -.3933 (140) | -.2765 (140) | -.5362 (140) | -.5252 (115) | -.4891 (140) | -.3712 (140) | .0149 (140) | -.2252 (140) | -.3928 (140) | -.3621 (89) | -.2762 (140) |
| 9008.PUTOT% | -.2724 (140) | -.4062 (140) | -.3090 (140) | -.5203 (140) | -.5304 (115) | -.4714 (140) | -.3650 (140) | -.0222 (140) | -.2645 (140) | -.3934 (140) | -.3356 (89) | -.2880 (140) |
| | 140 14 WKGRP | 141. 15 WKGRP | 142. 16 WKGRP | 143. 17 WKGRP | 144. 18 WKGRP | 145. 19 WKGRP | 146. 20 SATIS | 147. 21 LOWER | 148. 22 TRAIN | 149. 23 EQUAL | 150. DRUG&ALC | 152. 26 PERSO |

Table 14

Correlations Between Upgrade Percentages

and Wave 2 NHRMS Indexes

| VARIABLE | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9006.PU1% | -.2607 | -.2114 | -.2462 | -.2263 | -.2272 | -.2615 | -.2629 | -.2493 | -.2046 | -.2339 | -.3379 | -.3582 |
| | (171) | (171) | (171) | (171) | (163) | (171) | (171) | (171) | (171) | (171) | (170) | (171) |
| 9007.PU2% | -.3074 | -.2776 | -.3087 | -.2551 | -.2950 | -.3537 | -.3297 | -.3298 | -.4145 | -.2930 | -.4599 | -.3744 |
| | (171) | (171) | (171) | (171) | (163) | (171) | (171) | (171) | (171) | (171) | (170) | (171) |
| 9008.PUTOT% | -.3418 | -.2950 | -.3344 | -.2893 | -.3132 | -.3714 | -.3571 | -.3494 | -.3773 | -.3174 | -.4817 | -.4394 |
| | (171) | (171) | (171) | (171) | (163) | (171) | (171) | (171) | (171) | (171) | (170) | (171) |
| | 1127. | 1128. | 1129. | 1130. | 1131. | 1133. | 1134. | 1135. | 1136. | 1137. | 1138. | 1139. |
| | 1 COMM F | 2 DEC MA | 3 MOTIVA | 4 HUM RE | 5 FAIR-E | 7 SUP SU | 8 SUP TE | 9 SUP TE | 10 SUP G | 11 SUP W | 12 WKGRP | 13 WKGRP |
| 9006.PU1% | -.3506 | -.2911 | -.3554 | -.3582 | -.2200 | -.2456 | -.2599 | -.2552 | -.2695 | -.3102 | -.2990 | -.1820 |
| | (171) | (171) | (164) | (164) | (137) | (164) | (164) | (164) | (163) | (163) | (138) | (163) |
| 9007.PU2% | -.2856 | -.2860 | -.3297 | -.4149 | -.2576 | -.3057 | -.3194 | -.2681 | -.2411 | -.3864 | -.2122 | -.2312 |
| | (171) | (171) | (164) | (164) | (137) | (164) | (164) | (164) | (163) | (163) | (138) | (163) |
| 9008.PUTOT% | -.3792 | -.3455 | -.4050 | -.4615 | -.2886 | -.3300 | -.3467 | -.3111 | -.3013 | -.4171 | -.2985 | -.2476 |
| | (171) | (171) | (164) | (164) | (137) | (164) | (164) | (164) | (163) | (163) | (138) | (163) |
| | 1140. | 1141. | 1142. | 1143. | 1144. | 1145. | 1146. | 1147. | 1148. | 1149. | 1150. | 1152. |
| | 14 WKGRP | 15 WKGRP | 16 WKGRP | 17 WKGRP | 18 WKGRP | 19 WKGRP | 20 SATIS | 21 LOWER | 22 TRAIN | 23 EQUAL | DRUG&ALC | 26 PERSO |

Second, correlations to survey scores are consistently stronger for the percentages based on the second Upgrade program than for percentages based on the first Upgrade program. Taken in combination, these findings suggest that the strongest relationships are to be found with the maximum gap in time, in other words, from the first survey wave to the second Upgrade program, although all four sets are significant.

Another important observation is that the correlations are highest in relation to supervisory and workgroup relations NHRMS indexes, averaging about -.35 for both waves of survey data. Especially high are relationships to indexes of supervisory and workgroup support, supervisory goal emphasis, workgroup team coordination and workgroup coordination. Correlations to these four NHRMS indexes ranged between -.37 and -.52. That these measures, rather than Command Climate measures, relate especially strongly to Upgrade percentage, suggests that the organizational implication, causal or coincidental, involves the behavior of supervisors and other members of the workgroup to which the Upgrade case belonged.

Taken together these findings suggest that, indeed, an organizational connection exists to the incidence of Upgrade and that the organizational condition, whatever form it takes, exists over a substantial period of time, perhaps as long as three years.

## NHRMS Change Patterns

Since the sample of units had been selected with the idea in mind that the Human Resource Management (HRM) Program intervention activities would provide leverage for change, it was important in the present analysis to examine the extent to which this, in fact, held true. This present section of the report, therefore, looks at the overall pattern of change from Wave 1 to Wave 2 of NHRMS measurement, at a typology of unit change types which resulted, and at possible correlates or explanations of the resulting differences.

### Overall HRM Change Pattern

Gain scores for NHRMS indexes were obtained by subtracting the Wave 2 (or post) unit mean from the Wave 1 (or pre) unit mean. Therefore, a negative score indicated improvement, while a positive score indicated deterioration. The overall change pattern is presented in Table 15. From these data, it can be observed that:

- The range of gain scores is quite wide, from an improvement of nearly three-quarters of a scale point, to a deterioration of approximately that same amount.
- The average, or across-the-board, gain score on any index is quite small, ranging only from -.04 to +.02.
- The overall pattern, however, is one of improvement, and is significant by a Sign Test.

Table 15

NHRMS Unit Gain Scores
(Wave 1 - Wave 2) N=139 Units

| NHRMS Index | Maximum Unit Improvement | Maximum Unit Deterioration | Mean Gain Score | Gain Score S.D. |
|---|---|---|---|---|
| Command Climate | | | | |
| Communication Flow | -.61 | +.54 | -.03 | .21 |
| Decision Making Practices | -1.14 | +.73 | -.01 | .25 |
| Motivation | -.69 | +.61 | -.04 | .25 |
| Human Resources Emphasis | -.65 | +1.26 | -.02 | .25 |
| Fair & Equitable Treatment | -.92 | +.42 | -.02 | .22 |
| Supervisory Leadership | | | | |
| Supervisory Support | -.49 | +.52 | +.01 | .19 |
| Supervisory Team Coordination | -.43 | +.55 | -.01 | .20 |
| Supervisory Team Emphasis | -.75 | +.48 | -.03 | .21 |
| Supervisory Goal Emphasis | -.41 | +.50 | -.01 | .15 |
| Supervisory Work Facilitation | -.45 | +.36 | -.04 | .17 |
| Work Group Behavior | | | | |
| Work Group Support | -1.02 | +.40 | +.01 | .17 |
| Work Group Team Coordination | -.72 | +.48 | -.01 | .18 |
| Work Group Team Emphasis | -.79 | +1.02 | -.03 | .21 |
| Work Group Goal Emphasis | -.60 | +1.42 | -.02 | .21 |
| Work Group Work Facilitation | -.46 | +.47 | -.01 | .16 |
| Group Functioning & Satisfaction | | | | |
| Work Group Coordination | -.63 | +.66 | -.01 | .19 |
| Work Group Readiness | -.56 | +1.63 | +.02 | .24 |
| Work Group Discipline | -.88 | +1.63 | -.02 | .23 |
| Satisfaction | -.47 | +1.30 | -.04 | .20 |
| Other | | | | |
| Lower Level Influence | -1.46 | +1.10 | -.01 | .24 |
| Training | -.94 | +1.08 | -.04 | .22 |
| Equal Opportunity | -.55 | +.51 | -.02 | .19 |
| Personnel Orientation | -1.11 | +.54 | -.04 | .23 |
| Summary Statistics | | | | |
| Mean index gain score | -.02 | | | |
| Mean index gain score S.D. | .21 | | | |
| Mean Maximum Improvement | -.71 | | | |
| Mean Maximum Deterioration | +.78 | | | |
| 20 out of 23 index scores are negative (improvement) | | | | |
| Sign test $p<.01$ | | | | |

A Typology of Change

To further explore these changes, unit gain score profiles on NHRMS indexes were submitted to a hierarchical cluster analysis program called HGROUP (Veldman, 1967). This program starts by considering each original unit, of those to be clustered, as a "cluster." These N clusters are then reduced in number by a series of step-decisions until all N objects have been classified into one or the other of two clusters. At each step, the number of clusters is reduced by one by combining some pair of clusters. The particular pair which will be combined at any step is decided by examining all of the available combinations and choosing the one which minimally increases the total within-clusters variance. This latter minimizing function utilizes the distance measure, D, which takes account of profile shape, level, and dispersion. A substantial increase in within-clusters variance, which HGROUP labels an error term, indicates that the previous number of clusters is probably optimal for the original set of units.

This analysis resulted in five sets of units which differed from one another markedly in form or type of change[2]:

Type 1 - Modest improvement: up to approximately 1/4 S. D. improvement. (41% of all units)

Type 2 - Modest deterioration: up to approximately 1/4 S. D. deterioration. (16% of all units)

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[2]Two other "types" containing only one unit each, were dropped from further consideration.

Type 3 - Mixed effects: up to approximately 1/4 S. D. deterioration in Command Climate, but up to approximately 1/4 S. D. improvement in supervisory leadership and work group relations. (13% of all units)

Type 5 - Substantial improvement: up to approximately one S. D. improvement. (14% of all units)

Type 6 - Substantial deterioration: up to approximately one S. D. deterioration. (14% of all units)

Although intervention activity information was available for only a fraction of all units, there were sufficient data to examine the possible connection of what had been undertaken in the Unit by HRM program specialists. Table 16 presents a global analysis of these results.

It is apparent from these results that part of the difference among change types may possibly be attributed to the intervention activities chosen. With one exception (Communication and Team Building Workshop), all of those activities whose pattern showed improvements outweighing deterioration by two-to-one or better were those with a command flavor. On the other hand, those which missed this mark were either local work-group-oriented activities, less frequently used activities, or those units for whom intervention data are missing. (It may reasonably be expected that the last-named group contains a high proportion of those units which did nothing at all.)

HRM Center or Detachment makes some difference as well; unit type makes some difference; Fleet does not make a substantial difference, as the data in Table 17 show.

Table 16

HRM Intervention Activity
and Change Type

| Intervention Strategy | Percentage of Units | | Ratio of (1 & 5)/ (2 & 6) |
|---|---|---|---|
| | Types 1 & 5 (Improvement) | Types 2 & 6 (Deterioration) | |
| CAP (Command Action Plan) Workshop | 71 | 7 | 10.04 |
| Drug & Alcohol Workshop | 50 | 10 | 5.00 |
| Communication and Team Building Workshop | 80 | 20 | 4.00 |
| CRT (Command Retention Team) Workshop | 63 | 19 | 3.33 |
| Concepts Training Workshop | 60 | 20 | 3.00 |
| Survey Handback/ Feedback | 50 | 25 | 2.00 |
| CTT (Command Training Team) Workshop | 67 | 33 | 2.00 |
| Random Effects | 55 | 30 | 1.83 |
| Other Strategies | 48 | 29 | 1.67 |
| Goal Setting and Performance Analysis Workshop | 50 | 33 | 1.50 |
| Missing Data | 55 | 35 | 1.04 |
| Decision-Making/ Problem-Solving Workshop | 29 | 29 | 1.00 |

Table 17

| Center or Detachment | Percent of UIC's: Types 1 & 5 (Improvement) | Percent of UIC's: Types 2 & 6 (Deterioration) | Ratio of 1 & 5/2 & 6 |
|---|---|---|---|
| Atlantic Fleet | | | |
| A | 59 | 32 | 1.84 |
| B | 63 | 31 | 2.03 |
| C | 29 | 53 | .55 |
| D | 73 | 18 | 4.06 |
| Fleet Total | 56 | 32 | 1.75 |
| Pacific Fleet | | | |
| A | 46 | 48 | .96 |
| B | 50 | 50 | 1.00 |
| C | 70 | 10 | 7.00 |
| D | 100 | 0 | |
| E | 57 | 14 | 4.07 |
| F | 64 | 18 | 3.56 |
| Fleet Total | 57 | 28 | 2.04 |
| Unit Type | | | |
| Sub-surface | 70 | 25 | 2.80 |
| Air | 56 | 31 | 1.81 |
| Surface | 54 | 32 | 1.69 |
| Shore | 36 | 25 | 1.44 |

Table 18 presents mean gain scores by Center or Detachment. Once again, a negative gain score reflects improvement, whereas a positive gain score indicates deterioration. In examining these changes, a criterion of one-quarter standard deviation on Wave 1 overall NHRMS measures is employed to distinguish meaningful improvement or deterioration from change which likely has little meaning. The basis for this is past experience in similar civilian change or development efforts, in which an improvement of one-quarter standard deviation or more in survey measures has been associated with substantial subsequent performance improvement. (Bowers, 1976.)

The pattern presented is one in which 68 of the 230 measures (30 percent) show substantial improvement, while only 14 (6 percent) show substantial deterioration. Five of the Centers and Detachments (three in the Pacific Fleet; two in the Atlantic Fleet) show prevailing patterns of improvement in the units with which they worked. Three of the Centers and Detachments (two in the Pacific Fleet; one in the Atlantic Fleet) show prevailing patterns of deterioration in the units with which they worked. An analysis, whose results are not reported here, showed no clear pattern of intervention strategy's impact by Center and Detachment, probably because of the relatively small numbers of cases at this level of analysis.

Table 18

Mean Gain Scores

by Center or Detachment

| VARIABLE | 1/4 S.D. | PACIFIC FLEET | | | | | | ATLANTIC FLEET | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | A | B | C | D |
| Communication Flow | .07 | .04 | .01 | -.06 | -.27* | -.09* | -.06 | -.05 | -.05 | .08* | -.14* |
| Decision-Making Practices | .08 | .05 | .05 | -.04 | -.26* | -.02 | -.03 | -.10* | -.03 | .13* | -.04 |
| Motivational Conditions | .09 | .04 | .02 | -.04 | -.21* | -.07 | -.04 | -.09* | -.06 | .01 | -.14* |
| Human Resources Emphasis | .08 | .08 | .01 | .00 | -.23* | -.10* | .00 | -.08* | -.06 | .06 | -.07 |
| Fair and Equitable Treatment | .07 | .03 | .05 | -.07* | -.10* | -.20* | -.02 | -.05 | -.02 | .07* | -.09* |
| Supervisory Support | .07 | .04 | .02 | -.14* | -.08* | -.10* | .07* | -.02 | .05 | .03 | -.04 |
| Supervisory Team Coordination | .08 | .04 | .05 | -.15* | -.11* | -.14* | .06 | -.01 | .05 | .03 | -.04 |
| Supervisory Team Emphasis | .06 | .03 | .03 | -.15* | -.14* | -.28* | -.01 | -.04 | .05 | .00 | -.01 |
| Supervisory Goal Emphasis | .05 | .04 | -.01 | -.04 | .00 | -.19* | -.01 | -.02 | .08* | -.01 | -.05* |
| Supervisory Work Facilitation | .06 | -.01 | .05 | -.12* | -.03 | -.14* | -.02 | -.08* | .01 | -.03 | -.04 |
| Peer Support | .05 | .00 | .07* | -.08* | -.04 | -.07* | -.02 | .04 | .02 | .07* | -.03 |
| Peer Team Coordination | .06 | -.02 | .08* | -.05 | -.06* | -.14* | -.01 | .02 | .04 | .08* | -.04 |
| Peer Team Emphasis | .06 | .01 | .06* | -.07* | -.06* | -.26* | -.04 | .00 | .00 | .00 | -.06* |
| Peer Goal Emphasis | .07 | -.02 | .04 | -.02 | -.01 | -.20* | -.05 | .06 | -.01 | -.03 | -.05 |
| Peer Work Facilitation | .06 | .03 | .06* | -.05 | -.04 | -.17* | -.06* | .04 | -.04 | .00 | -.02 |
| Peer Coordination | .06 | .00 | .08* | -.08* | -.08* | -.17* | -.01 | .03 | -.01 | .05 | -.06* |
| Work Group Readiness | .08 | -.02 | .04 | -.08* | .06 | -.14* | .01 | .12* | .03 | .06 | -.08* |
| Discipline | .09 | .02 | .04 | -.08 | -.10* | -.12* | -.01 | .04 | -.06 | -.04 | -.03 |
| Satisfaction | .08 | -.01 | .01 | -.05 | -.22* | -.15* | -.05 | .03 | -.08* | .03 | -.06 |
| Lower Level Influence | .06 | .01 | .04 | -.08* | -.13* | -.15* | .04 | -.08* | -.04 | .03 | -.04 |
| Training | .07 | .02 | -.03 | -.04 | -.17* | -.25* | -.09* | -.05 | -.04 | .02 | -.04 |
| Equal Employment Opportunity | .08 | .06 | .01 | -.09* | -.23* | -.03 | -.04 | -.04 | -.06 | .08* | -.09* |
| Personnel Orientation | .08 | .01 | .00 | -.09* | -.08* | -.13* | -.09* | -.07 | -.08* | -.0 | -.08* |

## Change Type and Project Upgrade Percentages

In light of the fact that there had resulted significant correlations between prior NHRMS indexes and subsequent Project Upgrade percentages, it seemed appropriate to examine the connection, if any, between NHRMS gain scores and subsequent Upgrade percentages. For the sample as a whole, gain scores do, indeed, correlate with Project Upgrade percentages, such that the more the Unit improved its organizational functioning, the lower the subsequent Upgrade percentage. Table 19 presents these results.

A further question arose once one considered the distinctly different change types identified in the previous section. Specifically, it was the question of whether gain scores correlated with Upgrade percentages more or less uniformly across change types. Indeed, they do not, as the data in Table 20 indicate. These findings can be described as follows:

- Type 1 (Modest Improvement) - Very high negative correlations between supervisory leadership, peer relations, and outcome measures changes on the one hand, and Project Upgrade percentage on the other. (The more they improved the higher the subsequent Upgrade percentage.
- Type 2 (Modest Deterioration) - Only one significant correlation between survey change measures and Project Upgrade percentage.
- Type 3 (Mixed Effects) - High negative correlations between supervisory leadership and peer relations on the one hand, and subsequent Upgrade percentage on the other. (The more they improved, the higher the subsequent Upgrade percentage).

Table 19

Correlations Between Upgrade Percentages

and NHRMS Overall Gain Scores

| VARIABLE | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9006.PU1% | .1400 (139) | .0811 (139) | .1179 (139) | .0952 (139) | -.0423 (134) | -.0013 (139) | .0074 (139) | .0881 (139) | -.0429 (139) | .0224 (139) | .0055 (138) | .0402 (139) |
| 9007.PU2% | .1172 (139) | .0636 (139) | .1210 (139) | .1301 (139) | -.1302 (134) | -.0084 (139) | .0276 (139) | .0926 (139) | .0417 (139) | -.0767 (139) | -.0481 (138) | -.1314 (139) |
| 9008.PUTOT% | .1541 (139) | .0865 (139) | .1444 (139) | .1377 (139) | -.1077 (134) | -.0062 (139) | .0221 (139) | .1093 (139) | .0033 (139) | -.0375 (139) | -.0283 (138) | -.0632 (139) |
| | 2127. COMM F 1 | 2128. DEC MA 2 | 2129. MOTIVA 3 | 2130. HUM RE 4 | 2131. FAIR E 5 | 2133. SUP SU 7 | 2134. SUP TE 8 | 2135. SUP TE 9 | 2136. SUP G 10 | 2137. SUP W 11 | 2138. WKGRP 12 | 2139. WKGRP 13 |
| 9006.PU1% | .1363 (139) | .0385 (139) | .1807 (135) | .0343 (135) | -.0601 (108) | -.0482 (135) | .0115 (135) | .1797 (135) | .0081 (134) | .0978 (134) | .0714 (68) | -.0934 (134) |
| 9007.PU2% | .0744 (139) | -.0730 (139) | .1668 (135) | -.1225 (135) | -.2179 (108) | -.1826 (135) | .0242 (135) | .3163 (135) | .0438 (134) | .0768 (134) | -.2027 (68) | -.0019 (134) |
| 9008.PUTOT% | .1242 (139) | -.0262 (139) | .2033 (135) | -.0630 (135) | -.1758 (108) | -.1453 (135) | .0219 (135) | .3013 (135) | .0331 (134) | .1012 (134) | -.0912 (68) | -.0495 (134) |
| | 2140. WKGRP 14 | 2141. WKGRP 15 | 2142. WKGRP 16 | 2143. WKGRP 17 | 2144. WKGRP 18 | 2145. WKGRP 19 | 2146. SATIS 20 | 2147. LOWER 21 | 2148. TRAIN 22 | 2149. EQUAL 23 | 2150. DRUG&ALC | 2152. PERSO 26 |

Table 20A

Correlations Between Upgrade Percentages and HRMS Indexes by Change Type

## Change Type 1

| VARIABLE | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9006.PU1% | -.1964 (55) | -.1011 (55) | -.1843 (55) | -.2199 (55) | -.2229 (55) | -.3091 (55) | -.3107 (55) | -.2647 (55) | -.1989 (55) | -.2750 (55) | -.3356 (55) | -.4517 (55) |
| 9007.PU2% | -.3085 (55) | -.2761 (55) | -.3167 (55) | -.3444 (55) | -.3551 (55) | -.3992 (55) | -.3607 (55) | -.2809 (55) | -.2580 (55) | -.3139 (55) | -.5500 (55) | -.5768 (55) |
| 9008.PUTOT% | -.3087 (55) | -.2361 (55) | -.3076 (55) | -.3450 (55) | -.3537 (55) | -.4291 (55) | -.4046 (55) | -.3274 (55) | -.2769 (55) | -.3546 (55) | -.5425 (55) | -.6228 (55) |
| | 127. | 128. | 129. | 130. | 131. | 133. | 134. | 135. | 136. | 137. | 138. | 139. |
| | 1 COMM F | 2 DEC MA | 3 MOTIVA | 4 HUM RE | 5 FAIR-E | 7 SUP SU | 8 SUP TE | 9 SUP TE | 10 SUP G | 11 SUP W | 12 WKGRP | 13 WKGRP |
| 9006.PU1% | -.3113 (55) | -.3540 (55) | -.3949 (55) | -.4008 (55) | -.3210 (47) | -.2584 (55) | -.2555 (55) | -.2005 (55) | -.3030 (55) | -.2662 (55) | -.1176 (32) | -.2471 (55) |
| 9007.PU2% | -.4927 (55) | -.4872 (55) | -.5064 (55) | -.4858 (55) | -.4623 (47) | -.3571 (55) | -.4179 (55) | -.3910 (55) | -.3220 (55) | -.4436 (55) | -.2123 (32) | -.3823 (55) |
| 9008.PUTOT% | -.4918 (55) | -.5112 (55) | -.5459 (55) | -.5355 (55) | -.4797 (47) | -.3741 (55) | -.4126 (55) | -.3652 (55) | -.3751 (55) | -.4352 (55) | -.2063 (32) | -.3845 (55) |
| | 140. | 141. | 142. | 143. | 144. | 145. | 146. | 147. | 148. | 149. | 150. | 152. |
| | 14 WKGRP | 15 WKGRP | 16 WKGRP | 17 WKGRP | 18 WKGRP | 19 WKGRP | 20 SATIS | 21 LOWER | 22 TRAIN | 23 EQUAL | DRUG&ALC | 26 PERSO |

## Change Type 2

| VARIABLE | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9006.PU1% | -.1837 (22) | -.2255 (22) | -.1303 (22) | -.2617 (22) | -.1792 (22) | -.0686 (22) | -.1565 (22) | -.2394 (22) | -.2425 (22) | -.2043 (22) | -.2444 (22) | -.2557 (22) |
| 9007.PU2% | -.0240 (22) | -.0118 (22) | .1278 (22) | -.0168 (22) | -.0250 (22) | -.0398 (22) | -.0556 (22) | -.0367 (22) | -.0247 (22) | -.1369 (22) | -.1435 (22) | -.1219 (22) |
| 9008.PUTOT% | -.1009 (22) | -.1129 (22) | .0189 (22) | -.1330 (22) | -.0995 (22) | -.0569 (22) | -.1080 (22) | -.1349 (22) | -.1289 (22) | -.1811 (22) | -.2041 (22) | -.1958 (22) |
| | 127. | 128. | 129. | 130. | 131. | 133. | 134. | 135. | 136. | 137. | 138. | 139. |
| | 1 COMM F | 2 DEC MA | 3 MOTIVA | 4 HUM RE | 5 FAIR-E | 7 SUP SU | 8 SUP TE | 9 SUP TE | 10 SUP G | 11 SUP W | 12 WKGRP | 13 WKGRP |
| 9006.PU1% | -.3315 (22) | -.3752 (22) | -.3378 (22) | -.2830 (22) | -.6835 (16) | -.2782 (22) | -.2405 (22) | -.3278 (22) | -.3871 (22) | -.2076 (22) | -.3549 (15) | -.3409 (22) |
| 9007.PU2% | -.0896 (22) | -.1837 (22) | -.1806 (22) | -.2029 (22) | -.4638 (16) | -.2292 (22) | -.0518 (22) | -.0837 (22) | -.2161 (22) | -.0677 (22) | -.0497 (15) | -.2567 (22) |
| 9008.PUTOT% | -.2111 (22) | -.2904 (22) | -.2709 (22) | -.2592 (22) | -.6058 (16) | -.2734 (22) | -.1449 (22) | -.2057 (22) | -.3161 (22) | -.1394 (22) | -.1993 (15) | -.3199 (22) |
| | 140. | 141. | 142. | 143. | 144. | 145. | 146. | 147. | 148. | 149. | 150. | 152. |
| | 14 WKGRP | 15 WKGRP | 16 WKGRP | 17 WKGRP | 18 WKGRP | 19 WKGRP | 20 SATIS | 21 LOWER | 22 TRAIN | 23 EQUAL | DRUG&ALC | 26 PERSO |

## Change Type 3

VARIABLE

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9006 PU1% | -.3950 | -.4155 | -.3393 | -.3058 | -.2032 | -.3228 | -.3509 | -.2982 | -.3871 | -.2605 | -.4005 | -.4363 |
| | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) |
| 9007 PU2% | -.2044 | -.1652 | -.1234 | -.1126 | -.1849 | -.5192 | -.4470 | -.2336 | -.2710 | -.2309 | -.3822 | -.3805 |
| | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) |
| 9008 PUTOT% | -.3719 | -.3498 | -.2761 | -.2500 | -.2576 | -.5965 | -.5509 | -.3466 | -.4231 | -.3251 | -.5224 | -.5393 |
| | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) |
| | 127. | 128. | 129. | 130. | 131. | 133. | 134. | 135. | 136. | 137. | 138. | 139. |
| | 1 COMM F | 2 DEC MA | 3 MOTIVA | 4 HUM RE | 5 FAIR-E | 7 SUP SU | 8 SUP TE | 9 SUP TE | 10 SUP G | 11 SUP W | 12 WKGRP | 13 WKGRP |
| 9006 PU1% | -.3021 | -.3413 | -.3221 | -.3625 | -.2929 | -.3303 | -.3314 | -.3302 | -.1666 | -.4212 | -.4853 | -.0628 |
| | (17) | (17) | (17) | (17) | (12) | (17) | (17) | (17) | (17) | (17) | (9) | (17) |
| 9007 PU2% | -.1688 | -.1773 | -.1732 | -.2046 | .1460 | -.5864 | .0212 | -.0646 | .1796 | -.3828 | -.6711 | -.3974 |
| | (17) | (17) | (17) | (17) | (12) | (17) | (17) | (17) | (17) | (17) | (9) | (17) |
| 9008 PUTOT% | -.2947 | -.3219 | -.3087 | -.3554 | -.0598 | -.6561 | -.1519 | -.2226 | .0640 | -.5335 | -.6552 | -.3623 |
| | (17) | (17) | (17) | (17) | (12) | (17) | (17) | (17) | (17) | (17) | (9) | (17) |
| | 140. | 141 | 142. | 143. | 144. | 145. | 146. | 147. | 148. | 149. | 150. | 152. |
| | 14 WKGRP | 15 WKGRP | 16 WKGRP | 17 WKGRP | 18 WKGRP | 19 WKGRP | 20 SATIS | 21 LOWER | 22 TRAIN | 23 EQUAL | DRUG&ALC | 26 PERSO |



## Change Type 5

VARIABLE

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9006 PU1% | .0590 | .0256 | .1222 | .0965 | .0126 | .0093 | .0705 | .3646 | .2304 | .1976 | -.1065 | .0216 |
| | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) |
| 9007 PU2% | -.0408 | -.1353 | .0698 | -.0832 | -.0296 | .0065 | -.0715 | .1374 | -.1024 | -.1056 | -.1472 | -.1192 |
| | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) |
| 9008 PUTOT% | .0293 | -.0461 | .1380 | .0397 | -.0042 | .0111 | .0236 | .3762 | .1430 | .1137 | -.1635 | -.0414 |
| | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) |
| | 127. | 128. | 129. | 130. | 131. | 133. | 134. | 135. | 136. | 137. | 138. | 139. |
| | 1 COMM F | 2 DEC MA | 3 MOTIVA | 4 HUM RE | 5 FAIR-E | 7 SUP SU | 8 SUP TE | 9 SUP TE | 10 SUP G | 11 SUP W | 12 WKGRP | 13 WKGRP |
| 9006 PU1% | .1090 | -.1007 | .0802 | -.0162 | -.3157 | -.1208 | .0545 | .0018 | .1336 | -.1772 | .1485 | -.2224 |
| | (19) | (19) | (19) | (19) | (17) | (19) | (19) | (19) | (19) | (19) | (15) | (19) |
| 9007 PU2% | .0389 | -.0712 | -.1164 | -.0910 | -.3066 | -.1037 | .0247 | .0422 | .1302 | -.2045 | .2373 | -.2401 |
| | (19) | (19) | (19) | (19) | (17) | (19) | (19) | (19) | (19) | (19) | (15) | (19) |
| 9008 PUTOT% | .1114 | -.1205 | .0093 | -.0592 | -.4360 | -.1537 | .0583 | .0227 | .1778 | -.2518 | .2615 | -.3077 |
| | (19) | (19) | (19) | (19) | (17) | (19) | (19) | (19) | (19) | (19) | (15) | (19) |
| | 140 | 141 | 142 | 143. | 144. | 145. | 146 | 147. | 148. | 149. | 150 | 152. |
| | 14 WKGRP | 15 WKGRP | 16 WKGRP | 17 WKGRP | 18 WKGRP | 19 WKGRP | 20 SATIS | 21 LOWER | 22 TRAIN | 23 EQUAL | DRUG&ALC | 26 PERSO |

Table 20A (page 3)

Change Type 6

| VARIABLE | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9006.PU1% | -.3581 (19) | -.3784 (19) | -.4136 (19) | -.4000 (19) | -.4223 (19) | -.3816 (19) | -.4765 (19) | -.4564 (19) | -.4272 (19) | -.4361 (19) | -.4898 (19) | -.4707 (19) |
| 9007.PU2% | -.5264 (19) | -.4336 (19) | -.6086 (19) | -.5735 (19) | -.5273 (19) | -.7775 (19) | -.7312 (19) | -.5421 (19) | -.5872 (19) | -.6689 (19) | -.6759 (19) | -.5955 (19) |
| 9008.PUTOT% | -.4951 (19) | -.4579 (19) | -.5722 (19) | -.5453 (19) | -.5341 (19) | -.6428 (19) | -.6751 (19) | -.5625 (19) | -.5689 (19) | -.6178 (19) | -.6537 (19) | -.5995 (19) |
| | 127. 1 COMM F | 128. 2 DEC MA | 129. 3 MOTIVA | 130. 4 HUM RE | 131. 5 FAIR-E | 133. 7 SUP SU | 134. 8 SUP TE | 135. 9 SUP TE | 136. 10 SUP G | 137. 11 SUP W | 138. 12 WKGRP | 139. 13 WKGRP |
| 9006.PU1% | -.3193 (19) | -.3049 (19) | -.3786 (19) | -.4312 (19) | -.2794 (16) | -.3355 (19) | -.4800 (19) | -.1934 (19) | -.3696 (19) | -.4713 (19) | -.2691 (11) | -.4704 (19) |
| 9007.PU2% | -.4713 (19) | -.6015 (19) | -.5546 (19) | -.5354 (19) | -.3595 (16) | -.6727 (19) | -.5970 (19) | -.5140 (19) | -.4320 (19) | -.7127 (19) | -.5328 (11) | -.4611 (19) |
| 9008.PUTOT% | -.4425 (19) | -.5031 (19) | -.5224 (19) | -.5438 (19) | -.3555 (16) | -.5594 (19) | -.6059 (19) | -.3896 (19) | -.4518 (19) | -.6622 (19) | -.4479 (11) | -.5278 (19) |
| | 140. 14 WKGRP | 141. 15 WKGRP | 142. 16 WKGRP | 143. 17 WKGRP | 144. 18 WKGRP | 145. 19 WKGRP | 146. 20 SATIS | 147. 21 LOWER | 148. 22 TRAIN | 149. 23 EQUAL | 150. DRUG&ALC | 152. 26 PERSO |

Table 208

## Correlation of Upgrade Percentages and NHRMS Change Scores by Change Type

### Change Type 1

| VARIABLE | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9006 PU1% | .1370 | .2254 | -.0486 | -.1008 | .0161 | .0892 | .0503 | -.0584 | .0386 | .0840 | -.0247 | .0494 |
| | (55) | (55) | (55) | (55) | (55) | (55) | (55) | (55) | (55) | (55) | (55) | (55) |
| 9007 PU2% | .1457 | .2138 | .1107 | .0344 | -.0463 | -.0242 | -.1225 | -.0926 | -.0075 | .0080 | -.1249 | -.1101 |
| | (55) | (55) | (55) | (55) | (55) | (55) | (55) | (55) | (55) | (55) | (55) | (55) |
| 9008 PUTOT% | .1696 | .2621 | .0466 | -.0319 | -.0218 | .0322 | -.0535 | -.0924 | .0159 | .0505 | -.0955 | -.0458 |
| | (55) | (55) | (55) | (55) | (55) | (55) | (55) | (55) | (55) | (55) | (55) | (55) |
| | 2127 | 2128. | 2129. | 2130 | 2131. | 2133. | 2134. | 2135. | 2136. | 2137. | 2138 | 2139. |
| | COMM F 1 | DEC MA 2 | MOTIVA 3 | HUM RE 4 | FAIR E 5 | SUP SU 7 | SUP TE 8 | SUP TE 9 | SUP G 10 | SUP W 11 | WKGRP 12 | WKGRP 13 |
| 9006 PU1% | .1028 | -.0207 | .0223 | -.0037 | -.1150 | -.1768 | .0194 | .1631 | -.0376 | .2779 | .2648 | -.1674 |
| | (55) | (55) | (55) | (55) | (47) | (55) | (55) | (55) | (55) | (55) | (26) | (55) |
| 9007 PU2% | -.1727 | -.1485 | -.1587 | -.1122 | -.2542 | -.0313 | .0140 | -.0945 | -.0751 | .0827 | -.0621 | -.0247 |
| | (55) | (55) | (55) | (55) | (47) | (55) | (55) | (55) | (55) | (55) | (26) | (55) |
| 9008 PUTOT% | -.0582 | -.1088 | -.0923 | -.0758 | -.2299 | -.1159 | .0197 | .0257 | -.0696 | .2041 | .1125 | -.1065 |
| | (55) | (55) | (55) | (55) | (47) | (55) | (55) | (55) | (55) | (55) | (26) | (55) |
| | 2140 | 2141. | 2142. | 2143. | 2144. | 2145. | 2146. | 2147. | 2148. | 2149 | 2150. | 2152. |
| | WKGRP 14 | WKGRP 15 | WKGRP 16 | WKGRP 17 | WKGRP 18 | WKGRP 19 | SATIS 20 | LOWER 21 | TRAIN 22 | EQUAL 23 | DRUG&ALC | PERSO 26 |

### Change Type 2

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9006 PU1% | .0266 | -.0008 | -.0289 | -.2736 | .0253 | .0404 | -.0672 | -.1024 | -.1040 | -.1043 | -.0440 | -.1744 |
| | (22) | (22) | (22) | (22) | (22) | (22) | (22) | (22) | (22) | (22) | (22) | (22) |
| 9007 PU2% | .1454 | .1420 | .0119 | -.1392 | -.1041 | -.1455 | -.1585 | -.1585 | -.0925 | -.2847 | -.2177 | -.2652 |
| | (22) | (22) | (22) | (22) | (22) | (22) | (22) | (22) | (22) | (22) | (22) | (22) |
| 9008 PUTOT% | .1033 | .0883 | -.0061 | -.2150 | -.0532 | -.0720 | -.1305 | -.1470 | -.1065 | -.2267 | -.1567 | -.2473 |
| | (22) | (22) | (22) | (22) | (22) | (22) | (22) | (22) | (22) | (22) | (22) | (22) |
| | 2127 | 2128. | 2129. | 2130 | 2131 | 2133 | 2134 | 2135 | 2136 | 2137 | 2138 | 2139 |
| | COMM F 1 | DEC MA 2 | MOTIVA 3 | HUM RE 4 | FAIR E 5 | SUP SU 7 | SUP TE 8 | SUP TE 9 | SUP G 10 | SUP W 11 | WKGRP 12 | WKGRP 13 |
| 9006 PU1% | -.1498 | -.3934 | -.2877 | -.2044 | -.3187 | .1008 | -.2722 | .1310 | -.0725 | -.0070 | -.1314 | .2932 |
| | (22) | (22) | (22) | (22) | (15) | (22) | (22) | (22) | (22) | (22) | (14) | (22) |
| 9007 PU2% | -.0571 | -.3944 | -.2927 | -.2586 | -.4264 | -.1607 | .1246 | .1222 | .0189 | -.0662 | -.1343 | -.2698 |
| | (22) | (22) | (22) | (22) | (15) | (22) | (22) | (22) | (22) | (22) | (14) | (22) |
| 9008 PUTOT% | -.1058 | -.4305 | -.3175 | -.2573 | -.4114 | -.0533 | .2052 | .1377 | -.0221 | -.0446 | -.1467 | -.3058 |
| | (22) | (22) | (22) | (22) | (15) | (22) | (22) | (22) | (22) | (22) | (14) | (22) |
| | 2140 | 2141. | 2142 | 2143 | 2144 | 2145 | 2 | 2147 | 2148 | 2149 | 2150 | 2152 |
| | WKGRP 14 | WKGRP 15 | WKGRP 16 | WKGRP 17 | WKGRP 18 | WKGRP 19 | S... | 20 LOWER 21 | TRAIN 22 | EQUAL 23 | DRUG&ALC | PERSO 26 |

Table 20B (page 2)

## Change Type 3

| VARIABLE | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9006 PU1% | -.1438 | -.2079 | -.2017 | -.2113 | .1879 | .0071 | .0215 | -.0469 | -.4780 | -.2764 | .1431 | .0792 |
| | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) |
| 9007 PU2% | -.2848 | -.2624 | -.4612 | -.2357 | -.2127 | -.1261 | -.0435 | .0982 | -.0033 | -.4298 | .4991 | .0339 |
| | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) |
| 9008 PUTOT% | -.3101 | -.3244 | -.4864 | -.3039 | -.0806 | -.1011 | -.0252 | .0575 | -.2472 | -.4985 | .4879 | .0686 |
| | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) |
| | 2127. | 2128. | 2129. | 2130. | 2131. | 2133. | 2134. | 2135. | 2136. | 2137. | 2138. | 2139. |
| | COMM F 1 | DEC MA 2 | MOTIVA 3 | HUM RE 4 | FAIR E 5 | SUP SU 7 | SUP TE 8 | SUP TE 9 | SUP G 10 | SUP W 11 | WKGRP 12 | WKGRP 13 |
| 9006 PU1% | .3243 | .1274 | .1692 | .0471 | -.0587 | .5879 | .1289 | .0591 | .0882 | -.1073 | .1393 | .0070 |
| | (17) | (17) | (17) | (17) | (11) | (17) | (17) | (17) | (17) | (17) | (5) | (17) |
| 9007 PU2% | .1936 | .0537 | .1394 | .0205 | .4372 | -.2446 | .0536 | -.0645 | .1158 | -.1554 | -.1948 | -.4315 |
| | (17) | (17) | (17) | (17) | (11) | (17) | (17) | (17) | (17) | (17) | (5) | (17) |
| 9008 PUTOT% | .3267 | .1098 | .2024 | .0411 | .3595 | .0976 | .1104 | -.0233 | .1414 | -.1840 | -.0124 | -.3548 |
| | (17) | (17) | (17) | (17) | (11) | (17) | (17) | (17) | (17) | (17) | (5) | (17) |
| | 2140. | 2141. | 2142. | 2143. | 2144. | 2145. | 2146. | 2147. | 2148. | 2149. | 2150. | 2152. |
| | WKGRP 14 | WKGRP 15 | WKGRP 16 | WKGRP 17 | WKGRP 18 | WKGRP 19 | SATIS 20 | LOWER 21 | TRAIN 22 | EQUAL 23 | DRUG&ALC | PERSO 26 |

## Change Type 5

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9006 PU1% | -.0513 | -.1687 | .2231 | .1527 | .0584 | .2155 | .3298 | .6795 | .0818 | .3709 | -.0196 | .3150 |
| | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) |
| 9007 PU2% | .3159 | .2736 | .2764 | .2999 | .4391 | .2313 | -.0250 | .2646 | .0589 | -.2272 | -.0633 | .0593 |
| | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) |
| 9008 PUTOT% | .1149 | -.0053 | .3264 | .2788 | .2691 | .2975 | .2655 | .7053 | .0984 | .1990 | -.0482 | .2952 |
| | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) |
| | 2127 | 2128. | 2129. | 2130. | 2131. | 2133. | 2134. | 2135. | 2136. | 2137. | 2138. | 2139. |
| | COMM F 1 | DEC MA 2 | MOTIVA 3 | HUM RE 4 | FAIR E 5 | SUP SU 7 | SUP TE 8 | SUP TE 9 | SUP G 10 | SUP W 11 | WKGRP 12 | WKGRP 13 |
| 9006 PU1% | .3477 | -.0374 | .3732 | .1752 | .0127 | -.2127 | -.0496 | .1127 | .0882 | -.2650 | -.1393 | -.3382 |
| | (19) | (19) | (19) | (19) | (17) | (19) | (19) | (19) | (19) | (19) | (11) | (19) |
| 9007 PU2% | .2068 | .1373 | .1317 | .2578 | .1668 | .2653 | .3799 | -.0072 | .1692 | .2164 | .0374 | .3216 |
| | (19) | (19) | (19) | (19) | (17) | (19) | (19) | (19) | (19) | (19) | (11) | (19) |
| 9008 PUTOT% | .3966 | 0372 | .3805 | .2767 | .0939 | -.0465 | .1484 | .0914 | .1591 | -.1151 | -.1015 | -.1241 |
| | (19) | (19) | (19) | (19) | (17) | (19) | (19) | (19) | (19) | (19) | (11) | (19) |
| | 2140 | 2141. | 2142. | 2143. | 2144. | 2145. | 2146. | 2147. | 2148. | 2149. | 2150. | 2152 |
| | WKGRP 14 | WKGRP 15 | WKGRP 16 | WKGRP 17 | WKGRP 18 | WKGRP 19 | SATIS 20 | LOWER 21 | TRAIN 22 | EQUAL 23 | DRUG&ALC | PERSO 26 |

Change Type 6

Table 20B (page 3)

| VARIABLE | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [illegible] | PU1% | .4303 | -.0837 | .2881 | .1285 | -.1181 | -.0355 | -.1674 | -.1171 | -.2951 | -.0838 | .0615 | .1854 |
| | | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) |
| [illegible] | PU2% | .2931 | -.1204 | -.0815 | -.2819 | -.2060 | -.2377 | .0390 | .1000 | .1353 | -.0643 | -.1595 | -.1653 |
| | | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) |
| [illegible] | PUTOT% | .4144 | -.1143 | .1298 | -.0727 | -.1806 | -.1478 | -.0798 | -.0171 | -.1053 | -.0846 | -.0479 | .0234 |
| | | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) | (19) |
| | | 2127. | 2128. | 2129. | 2130. | 2131. | 2133. | 2134. | 2135. | 2136. | 2137. | 2138. | 2139. |
| | | COMM F 1 | DEC MA 2 | MOTIVA 3 | HUM RE 4 | FAIR E 5 | SUP SU 7 | SUP TE 8 | SUP TE 9 | SUP G 10 | SUP W 11 | WKGRP 12 | WKGRP 13 |
| [illegible] | PU1% | .4713 | .3583 | .5816 | .2879 | .1344 | .0692 | -.0307 | .4856 | .1795 | .0038 | .2077 | -.1650 |
| | | (19) | (19) | (19) | (19) | (15) | (19) | (19) | (19) | (19) | (19) | (10) | (19) |
| [illegible] | PU2% | .0371 | -.0265 | .2863 | .1450 | -.1478 | -.2357 | .0610 | .3311 | .2530 | -.0404 | .0490 | -.2292 |
| | | (19) | (19) | (19) | (19) | (15) | (19) | (19) | (19) | (19) | (19) | (10) | (19) |
| [illegible] | PUTOT% | .3028 | .2012 | .5017 | .2500 | .0021 | -.0838 | .0140 | .4678 | .2424 | -.0192 | .1512 | -.2210 |
| | | (19) | (19) | (19) | (19) | (15) | (19) | (19) | (19) | (19) | (19) | (10) | (19) |
| | | 2140. | 2141. | 2142. | 2143. | 2144. | 2145. | 2146. | 2147. | 2148. | 2149. | 2150. | 2152. |
| | | WKGRP 14 | WKGRP 15 | WKGRP 16 | WKGRP 17 | WKGRP 18 | WKGRP 19 | SATIS 20 | LOWER 21 | TRAIN 22 | EQUAL 23 | DRUG&ALC | PERSO 26 |

- Type 5 (Substantial Improvement) - Almost no correlation between survey change scores and subsequent Upgrade percentage.

- Type 6 (Substantial Deterioration - High negative correlation between almost all survey change scores on the one hand and subsequent Upgrade percentage on the other. (The less they deteriorated, the higher the subsequent Upgrade percentage.)

One final finding concerning these change types and Upgrade percentage is worth noting: there was no significant difference among change types in the overall percentage of Upgrade cases.

## SUMMARY

This is the first report of findings from a research effort comprising two separate purposes:

- to develop a system of current-value human resources accounting with Navy applicability
- to examine the causes and consequences of Project Upgrade, a Navy program for discharging under performers.

The first of these purposes involved using measures of organizational management practices to forecast and estimate the value of changes in unit performance. The second involved testing the comparative importance of individual (personal unsuitability) versus organizational causes of under-performance and Upgrade.

A sample of 174 Navy units, drawn largely from and found to be representative of the fleet, was selected. Each unit had at least two waves of Navy Human Resource Management Survey (NHRMS) data available on or after July 1, 1978. Data about the HRM Program activities--workshops and interventions--were added as well, to provide some added control on the amount and nature of change.

To these two bodies of data unit performance measures were added. Reenlistment rates, unauthorized absence and desertion rates, non-judicial punishment rates, and readiness (FORSTAT) ratings were obtained for the sample for periods, varying somewhat in length by measure, from July 1978 through September 1982. These measures were then standardized (converted to standard scores within the calendar period, to eliminate seasonal effects) and

relativized (to place each unit's performance periods in a common position from the first wave of NHRMS data.) Refresher training (REFTRA) data were also available for a small sub-sample. Upgrade incidence percentages for Upgrade 1 (July-August 1981), Upgrade 2 (February-March 1982) and Total Upgrade (1 and 2 combined) were calculated and added as well.

This present report presents the initial findings of both aspects of the effort. Some of those findings establish the basic properties of the data sets:

- NHRMS data appear to be reliable, as they have proved to be in previous studies.
- Performance measures analyzed as of the time of this report appear to be reasonably reliable over time.
- Upgrade 1 rates are modestly, but significantly, correlated with Upgrade 2 rates.
- HRM Program interventions appear to have produced sufficient varied change to provide the leverage necessary for a test of current value human resources accounting methodology.

The substantive findings are, in some instances reassuring to the purposes of the effort:

- NHRMS measures predict reenlistment and UA/Desertion rates with much the same "two-humped" pattern of relationship (one concurrent, the other future-predictive) found in earlier studies.
- NHRMS measures correlate with interim REFTRA scores.
- Wave 1 NHRMS indexes correlate significantly with Wave 2 NHRMS indexes.

Other findings appear to be more surprising:

- Units can be differentiated into five clearly distinct change "types," ranging from substantial improvement through modest improvement, and modest deterioration to substantial deterioration, with one category or type having mixed effects.

- By far the largest type in numbers of units is that of modest improvement.

- Upgrade percentage is strongly correlated with prior NHRMS indexes, with the strongest relationships being those representing the longest time gap, that is, NHRMS wave 1 to Upgrade 2.

- Upgrade percentage is correlated with NHRMS gain score across-the-board, such that, the more the unit improved its functioning, the lower its subsequent Upgrade percentage.

- Upgrade percentage correlates with NHRMS gain score differentially by change type, however, in what appears to be a complex pattern.

In remaining analyses and reports, the current value human resources accounting aspect of the research will calculate the relationship of NHRMS indexes to non-judicial punishment and readiness measures, generate multivariate predictions by time period, and calculate the value of assessed impact.

The Upgrade aspect will involve the analysis of case study interview data, collected in a sub-set of the units, in an effort to distinguish possible individual and organizational causes of under-performance. These will then be analyzed within the framework of the rather surprising long-term tie between management practices (as much as two or three years earlier) and Upgrade incidence two to three years later.

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